

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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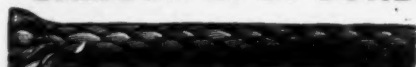


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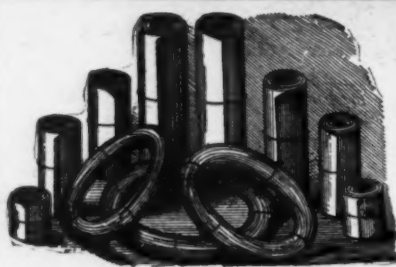
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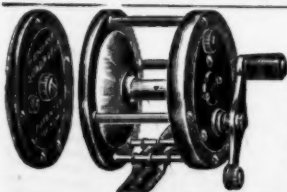
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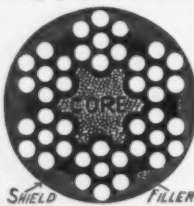
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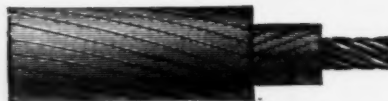
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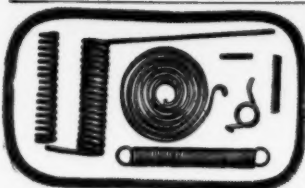
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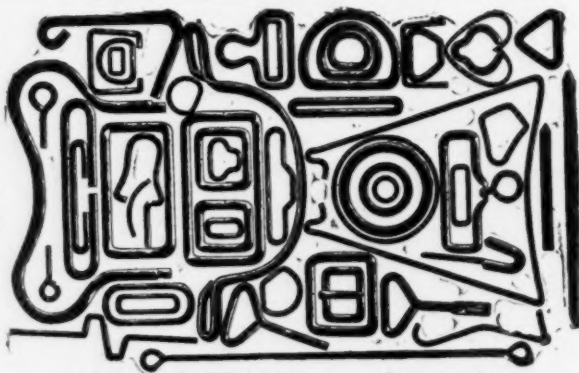
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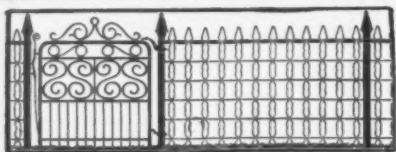
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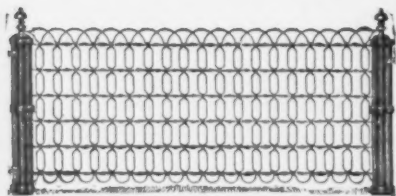
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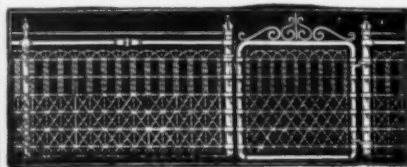
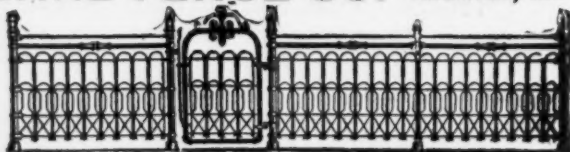
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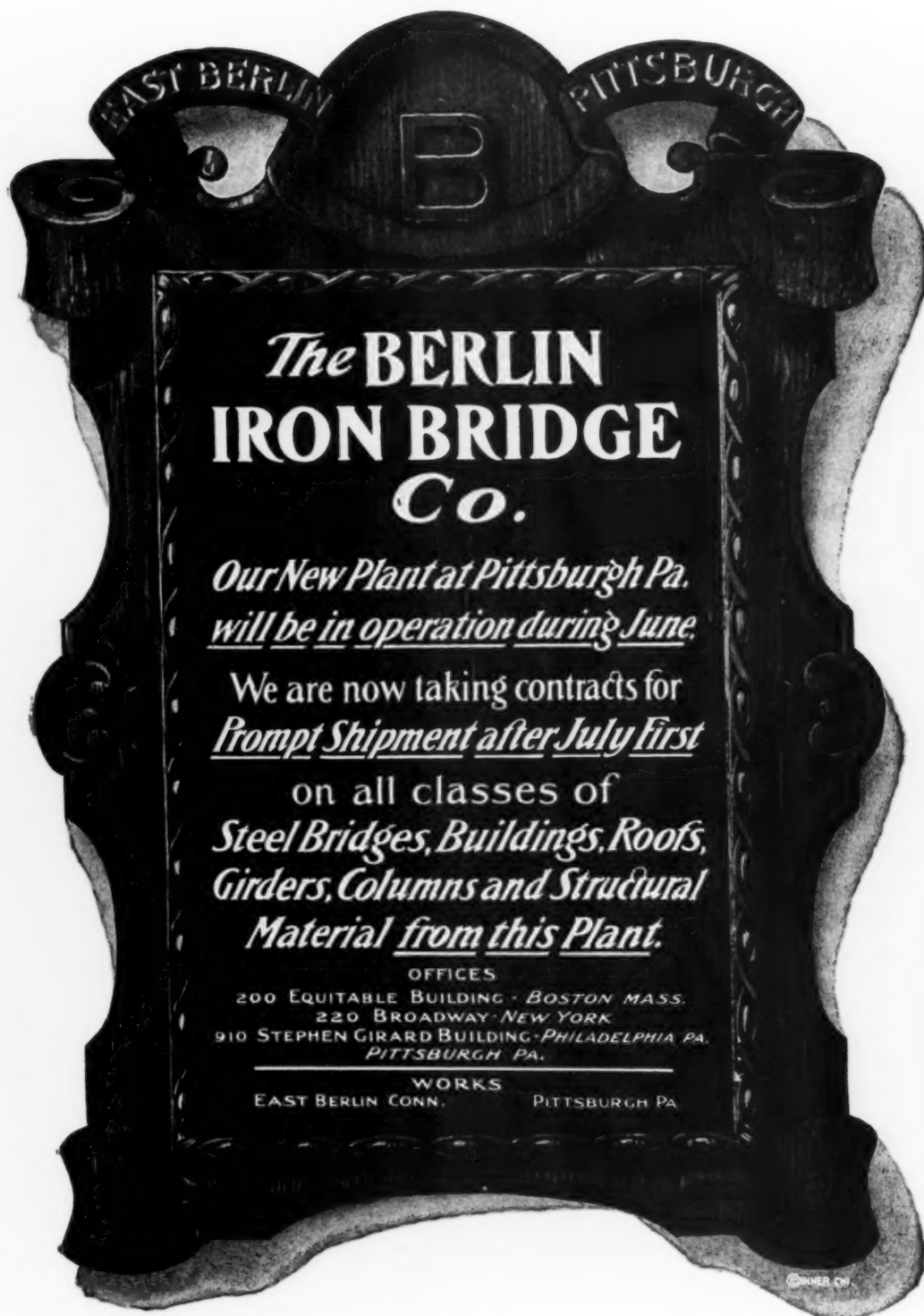
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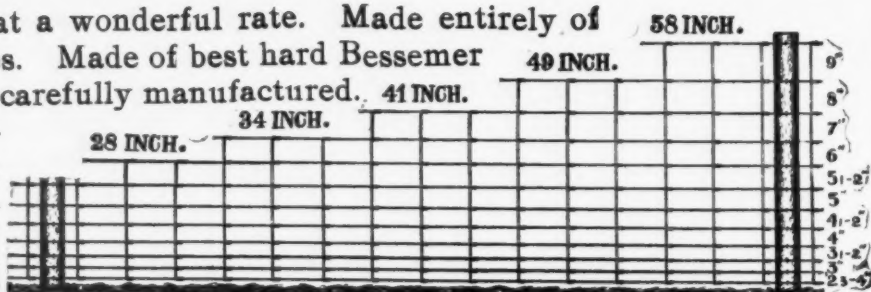
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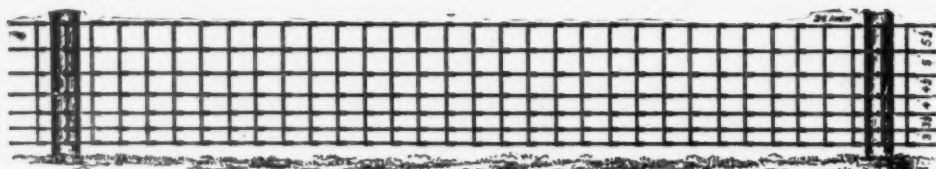
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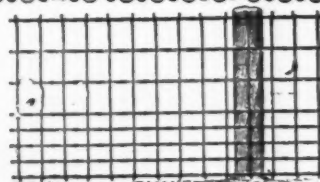
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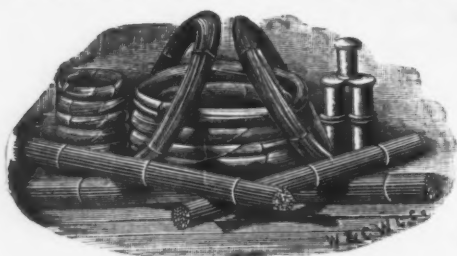
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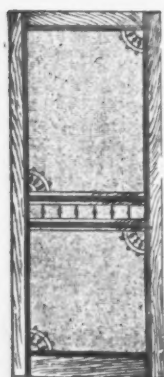
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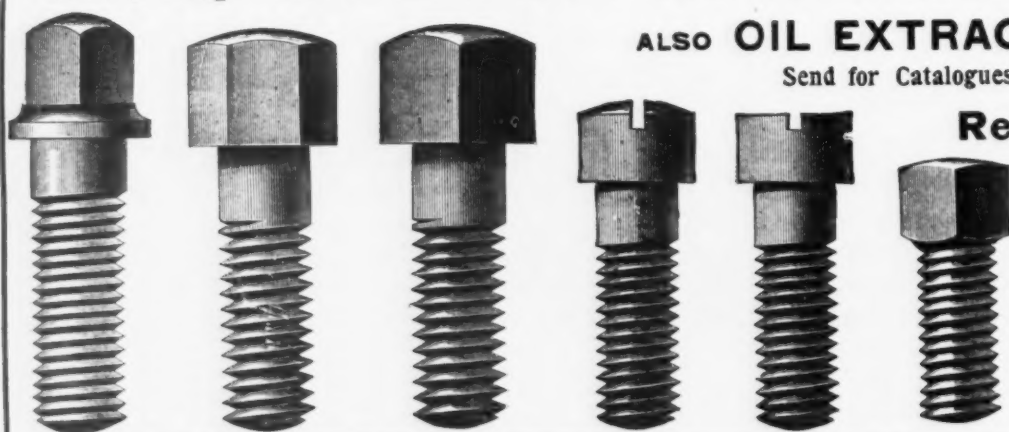
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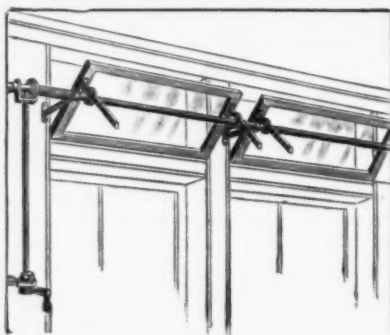
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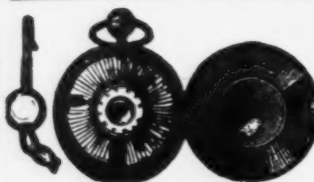
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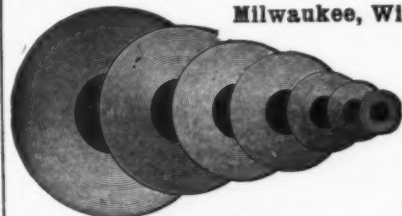
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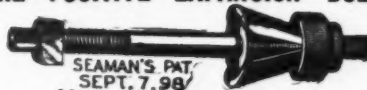
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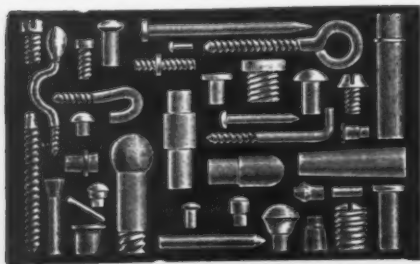
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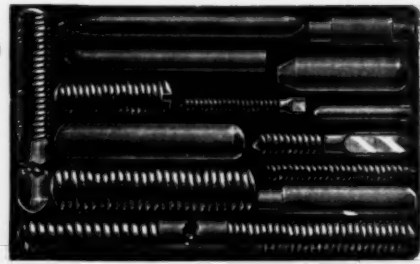
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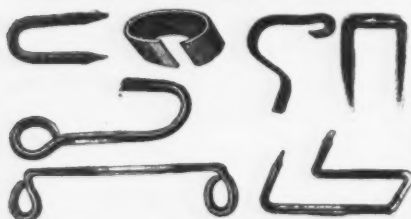
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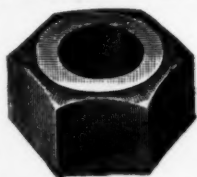
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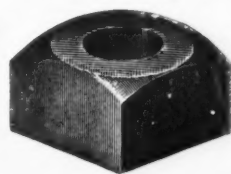
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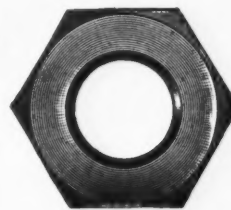
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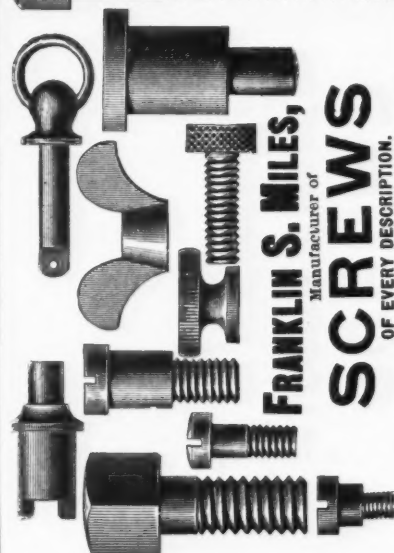
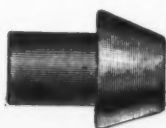
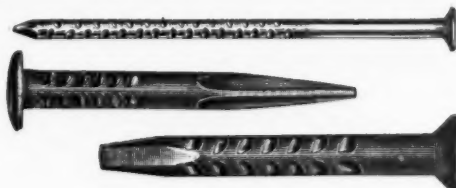
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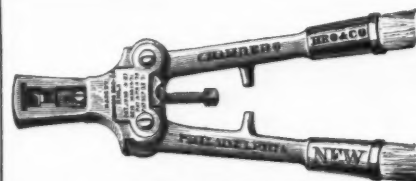


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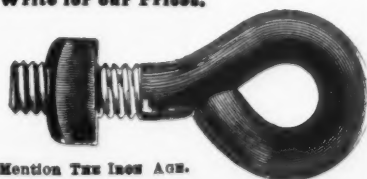
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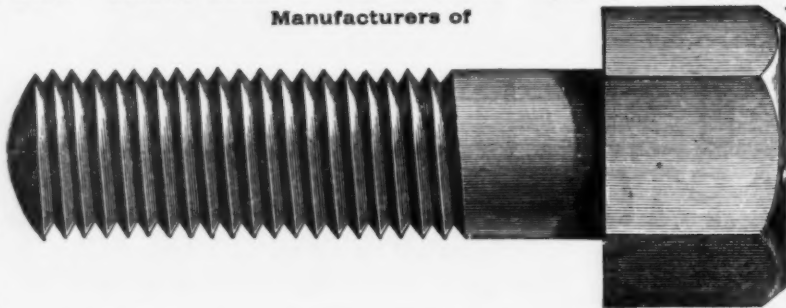
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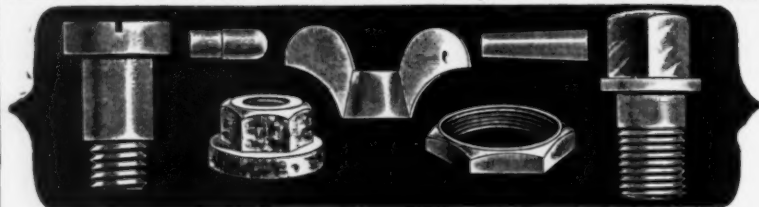
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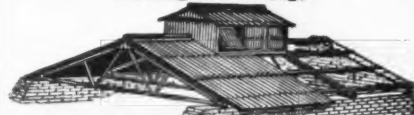
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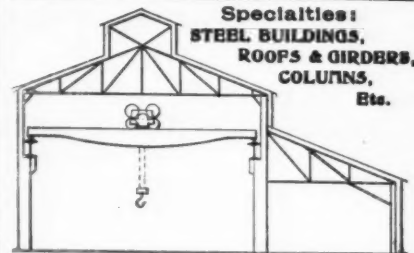
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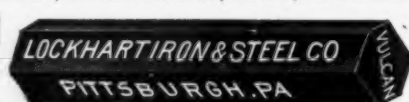
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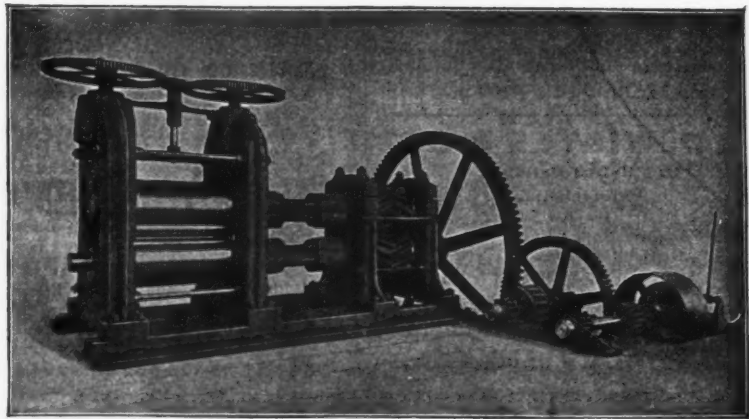
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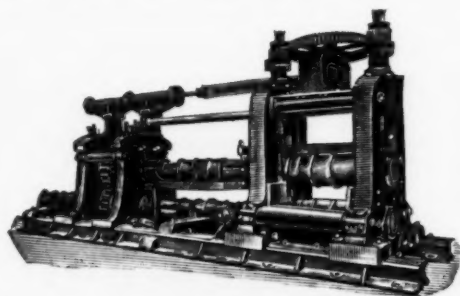
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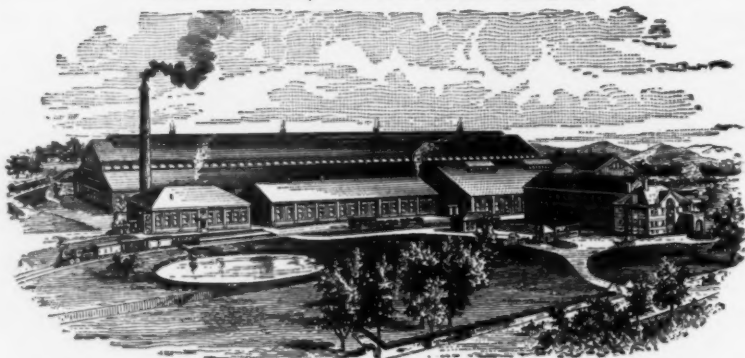
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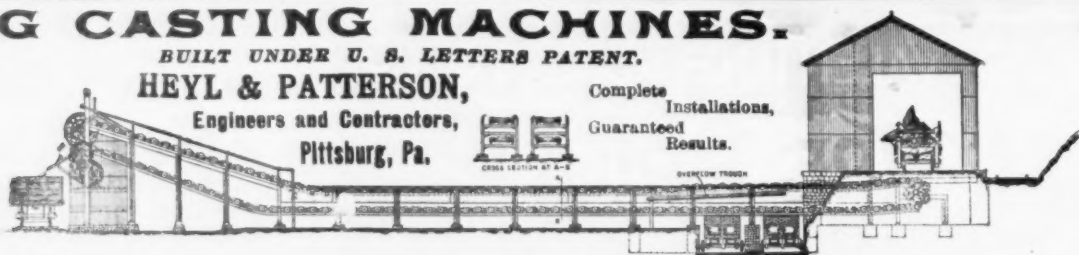
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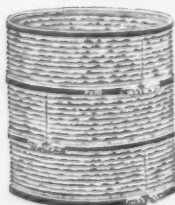
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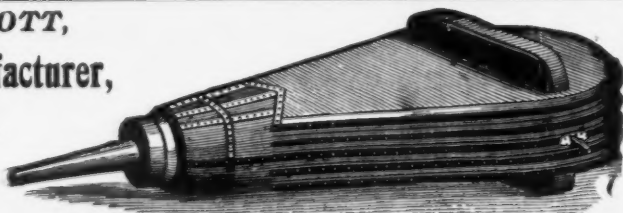
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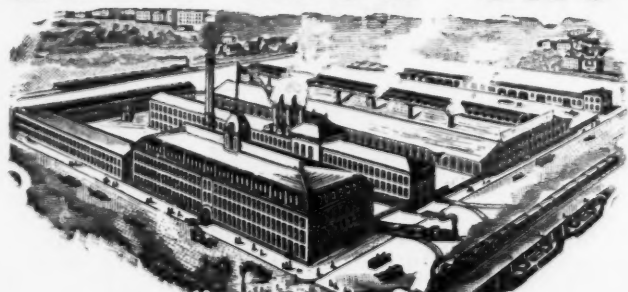
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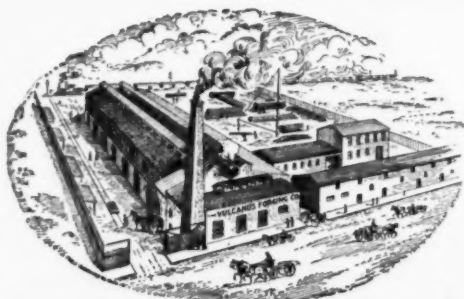
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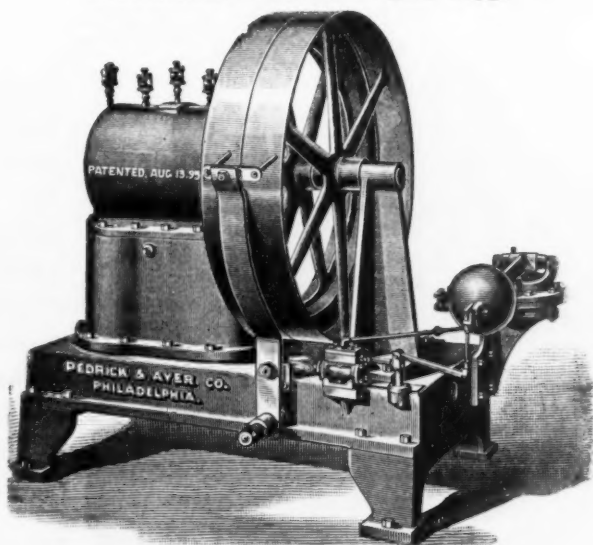
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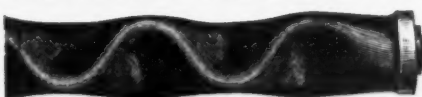


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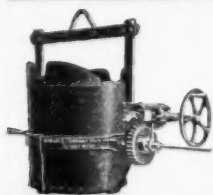
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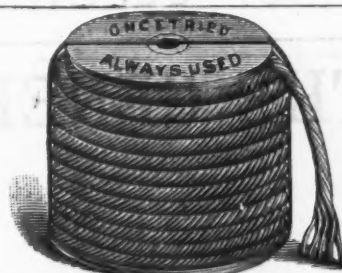


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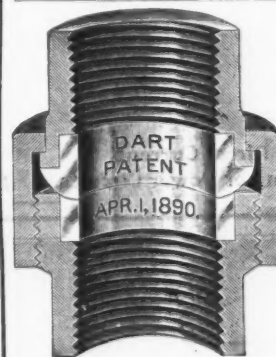
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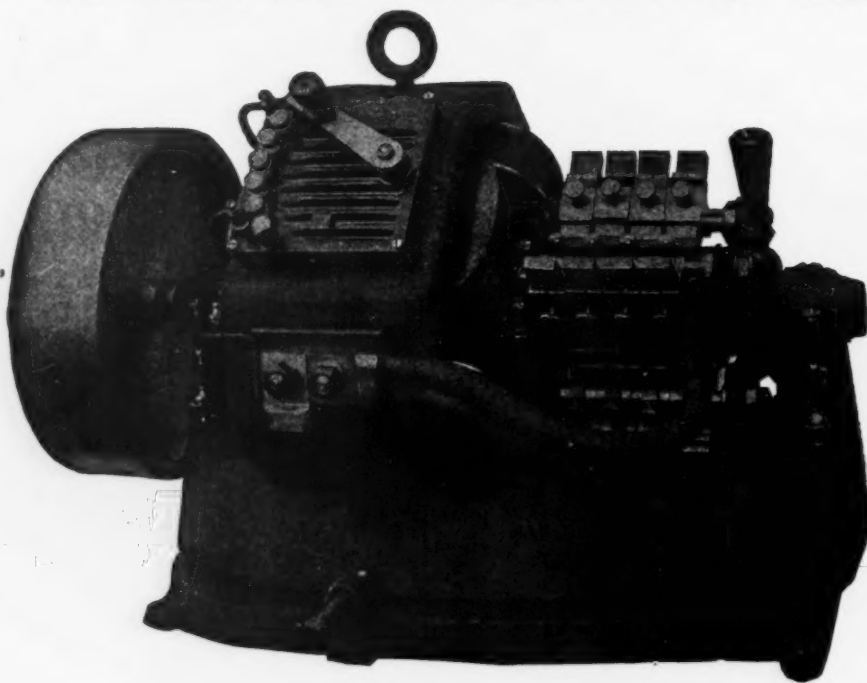


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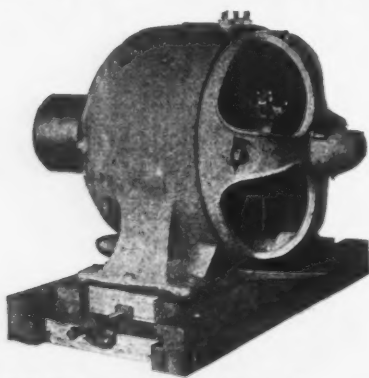
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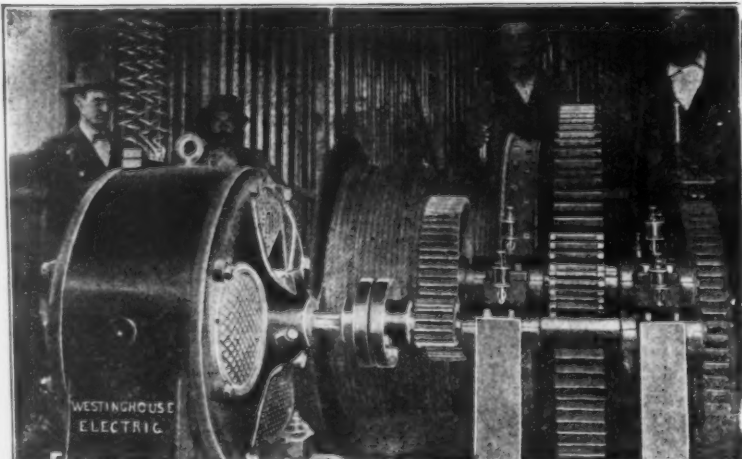
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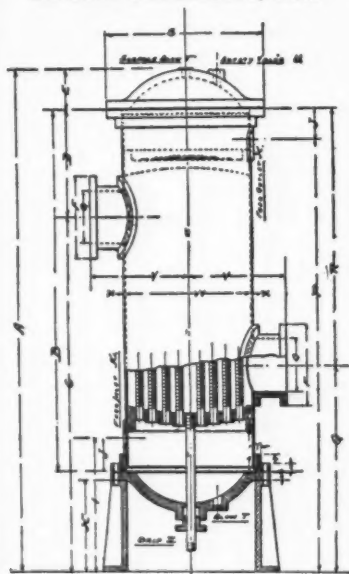
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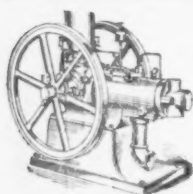
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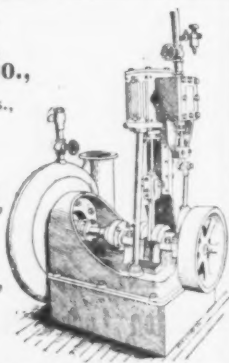
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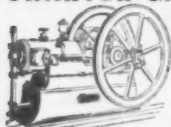
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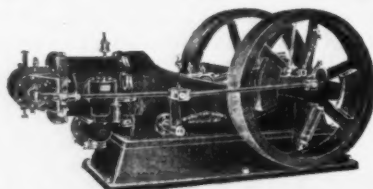
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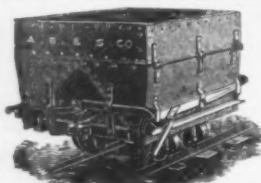


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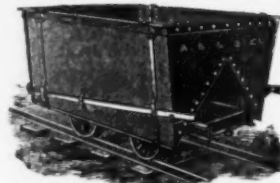


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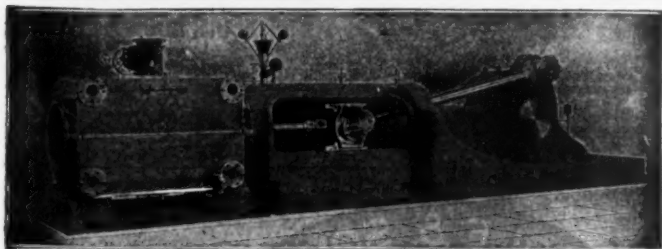
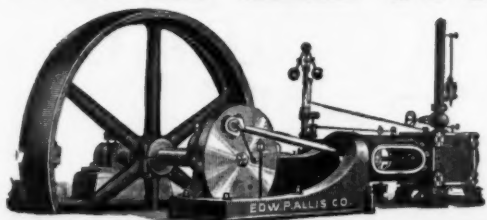
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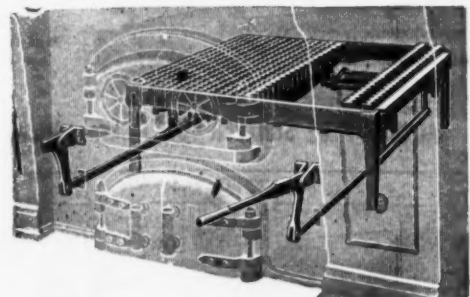
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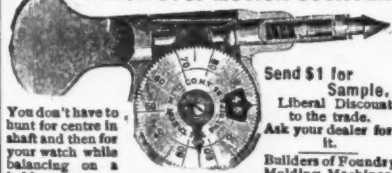
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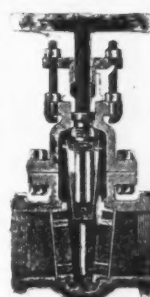
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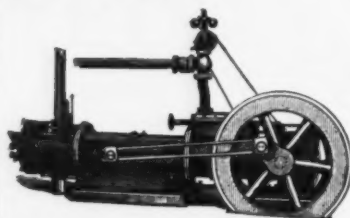
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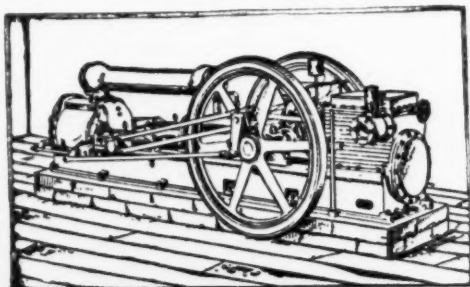
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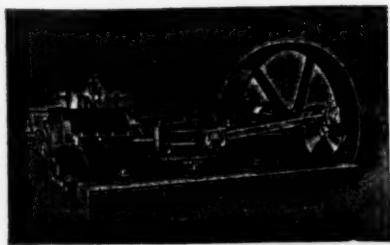
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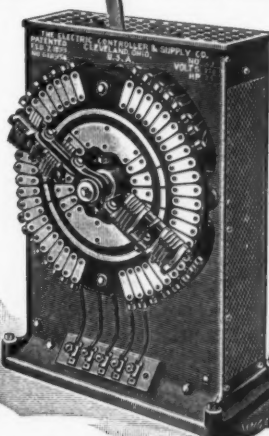
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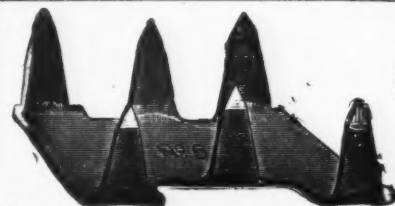
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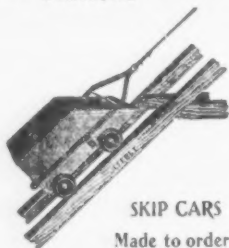
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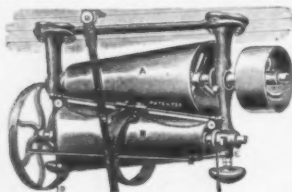
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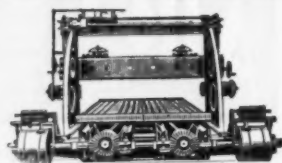
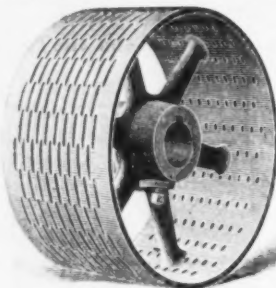
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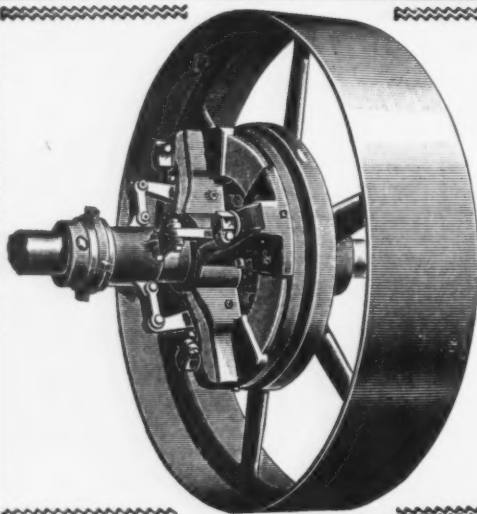
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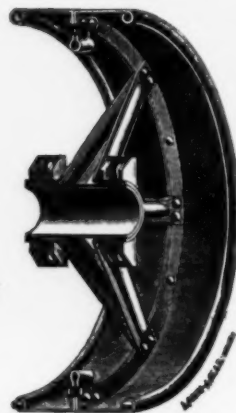
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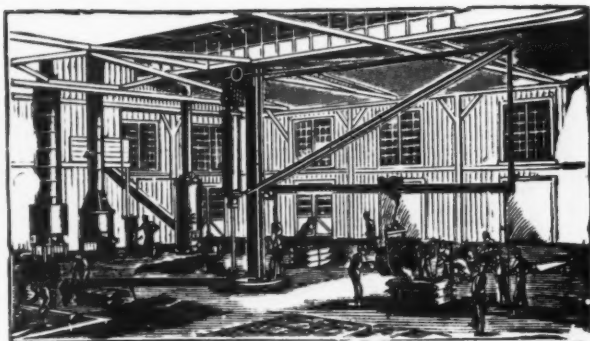
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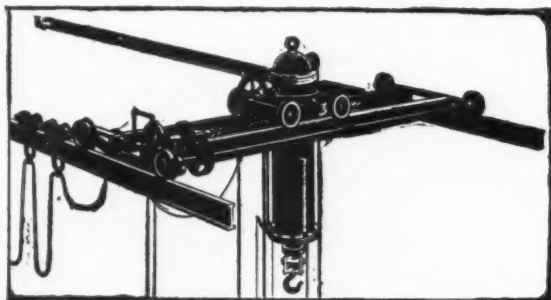
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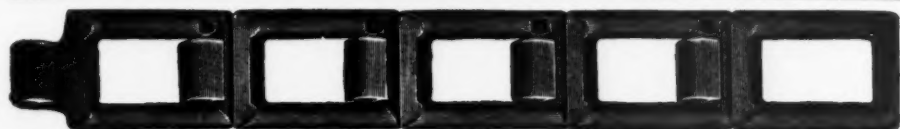
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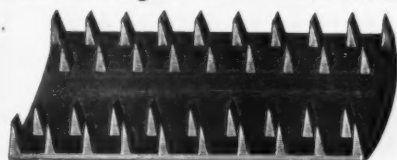
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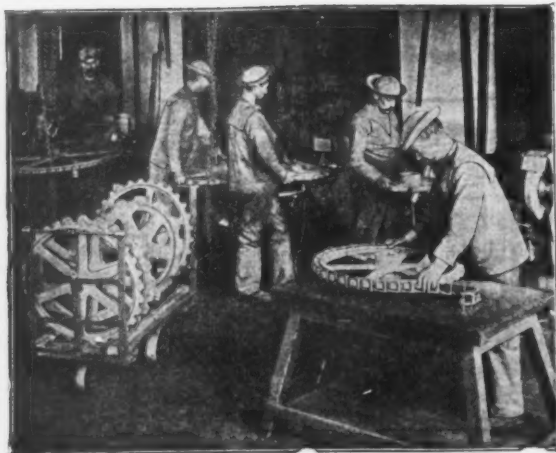
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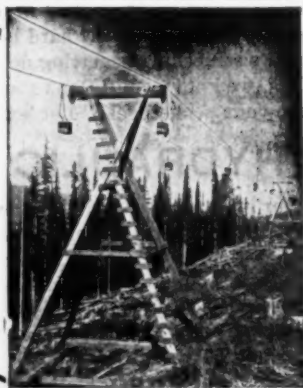
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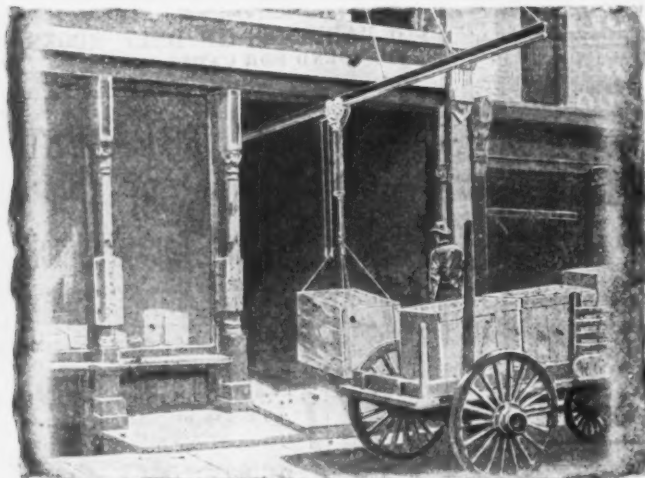
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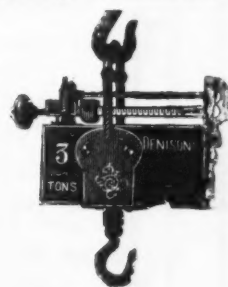
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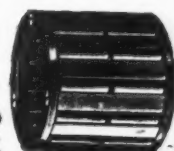
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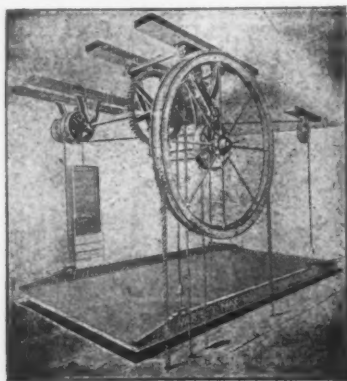
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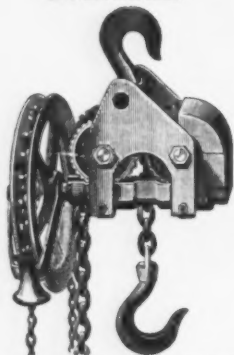
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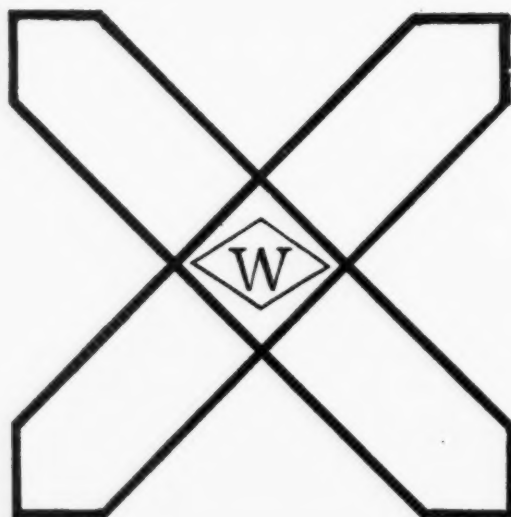
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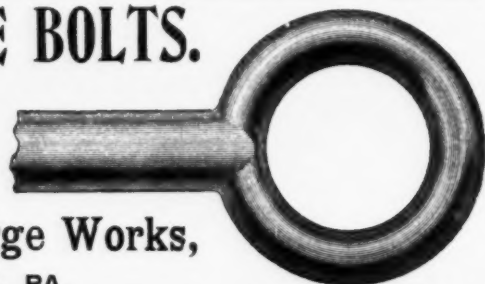
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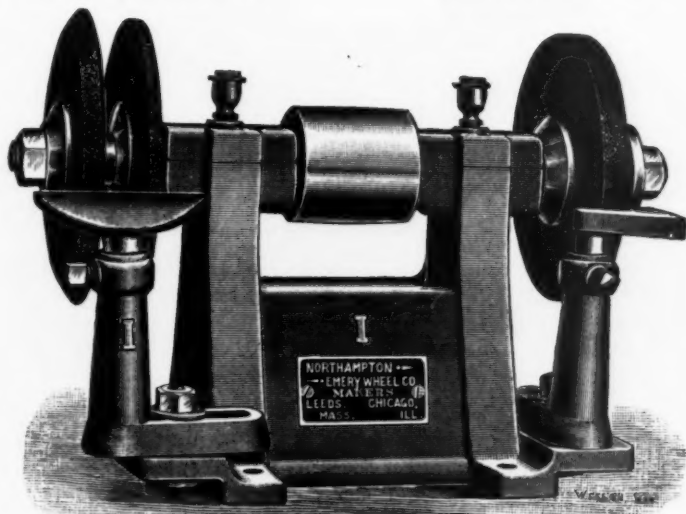
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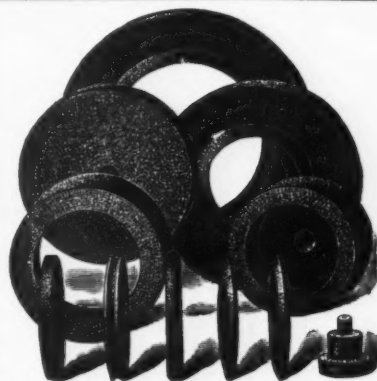
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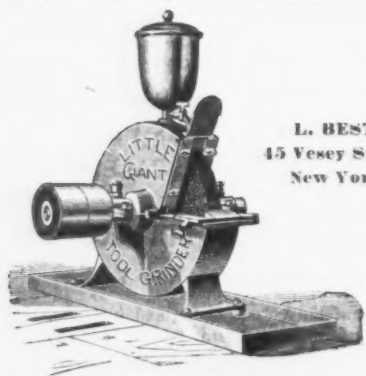


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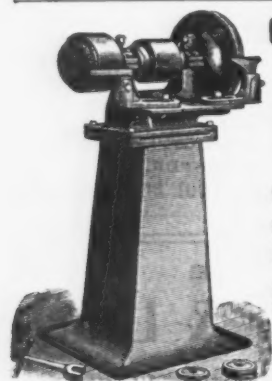
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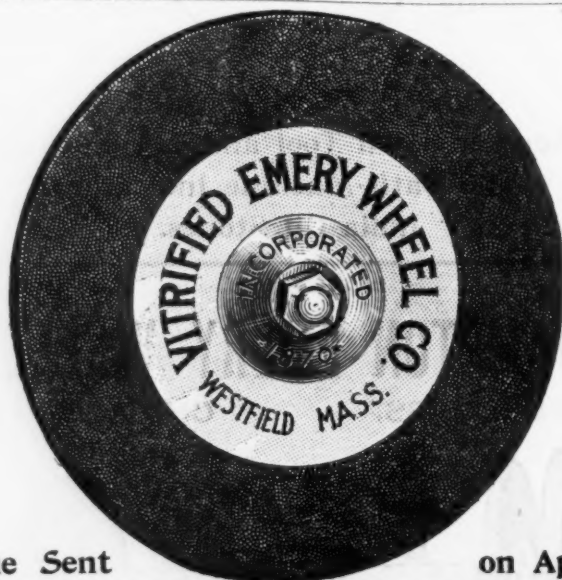
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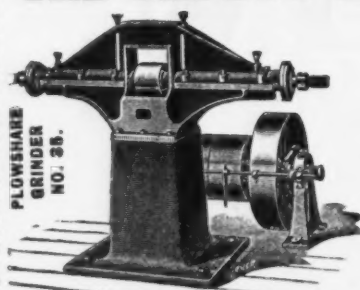
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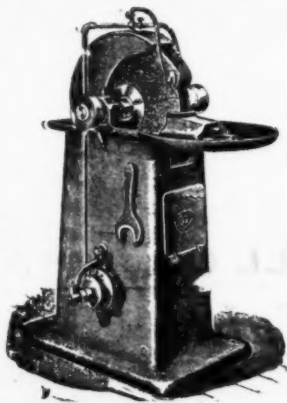
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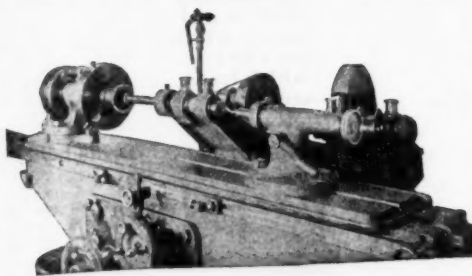
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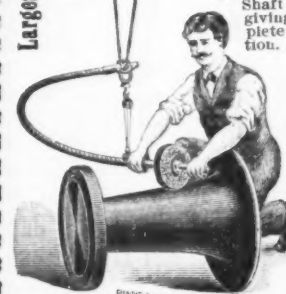
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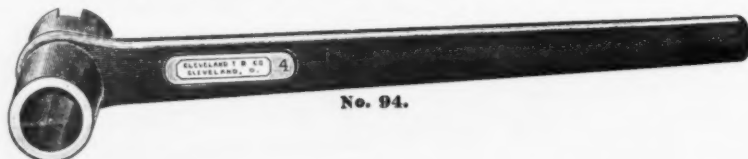
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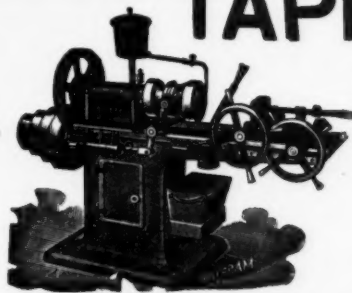
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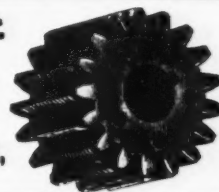
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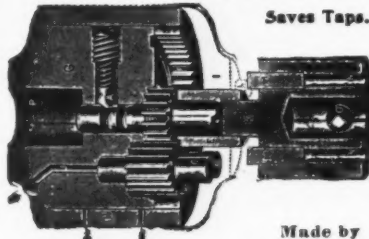
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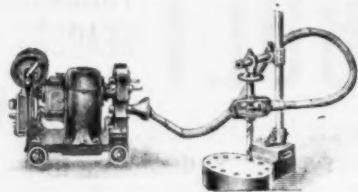
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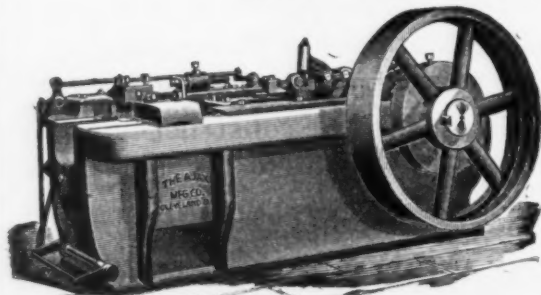


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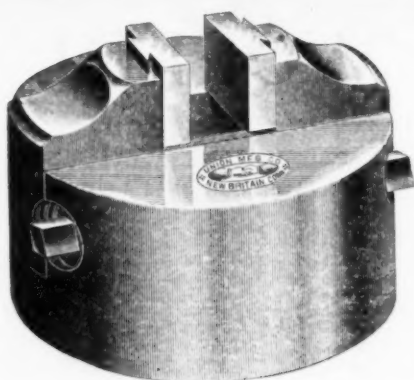
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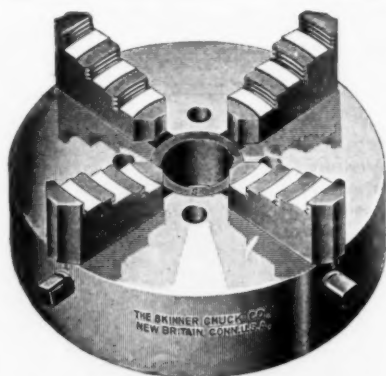
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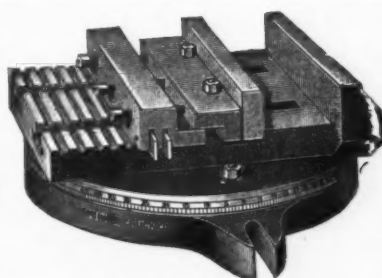
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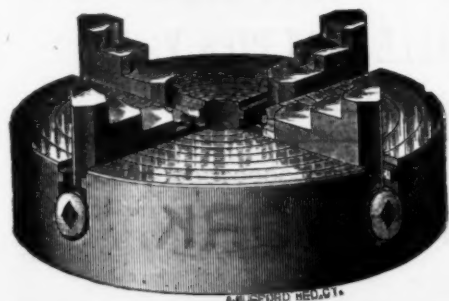
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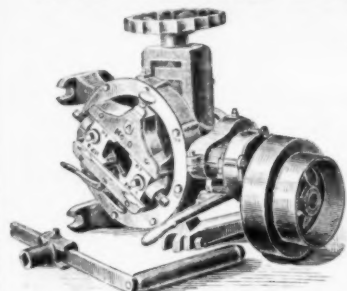
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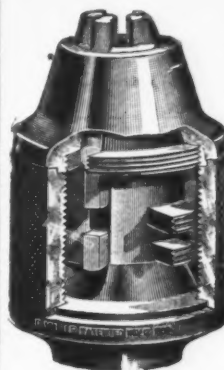


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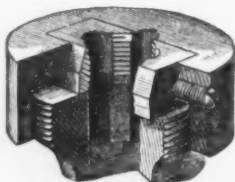
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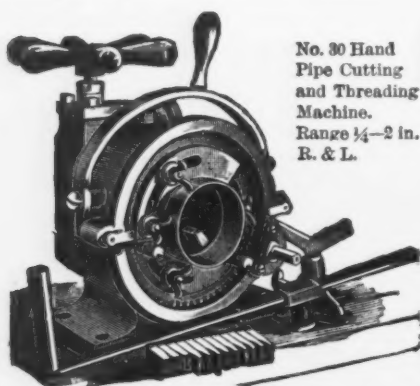
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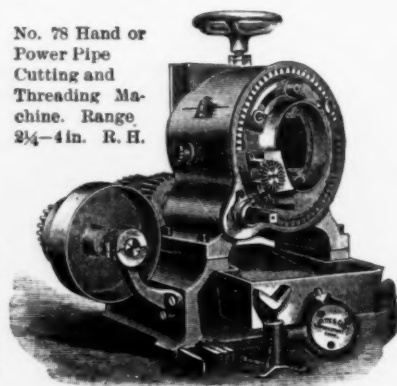
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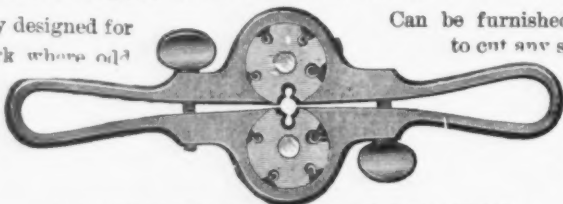


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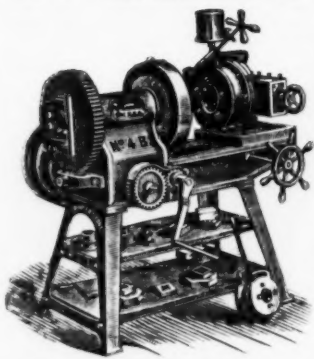
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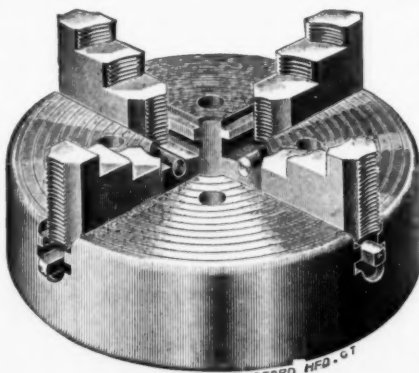
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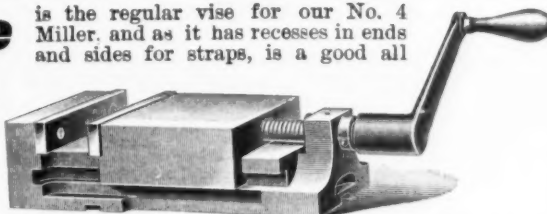
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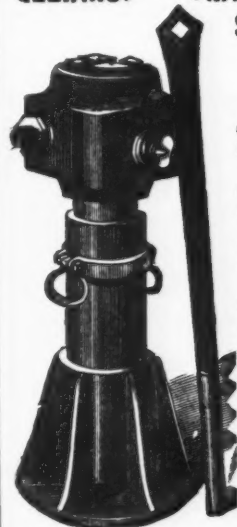
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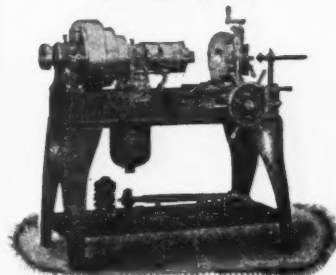
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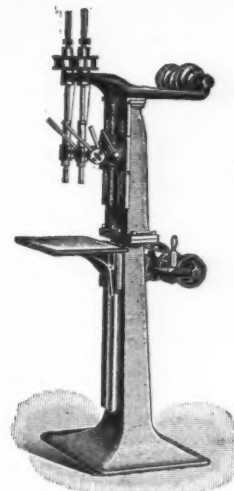


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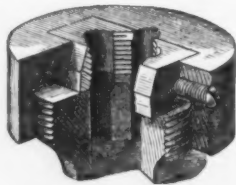
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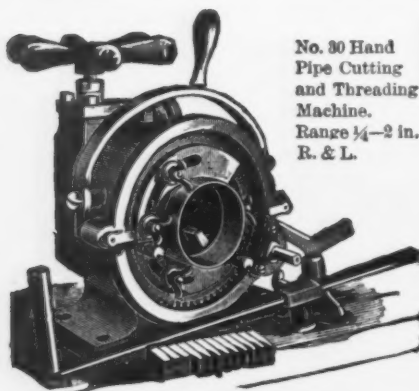
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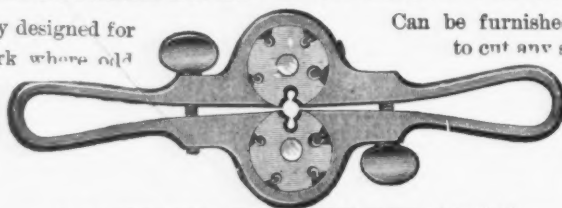


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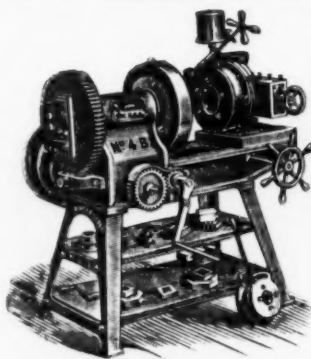




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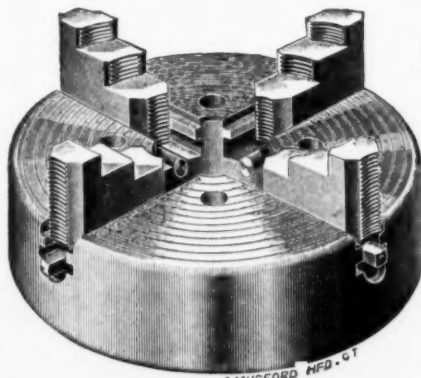
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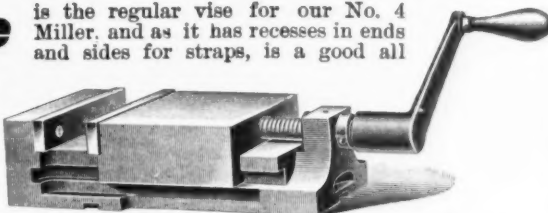
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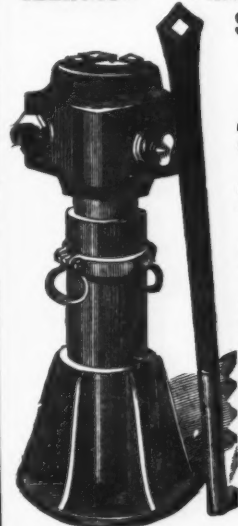
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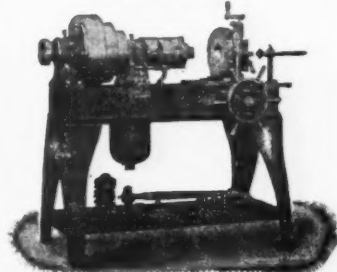
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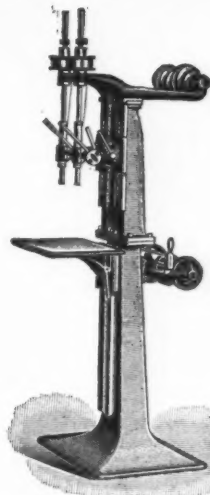


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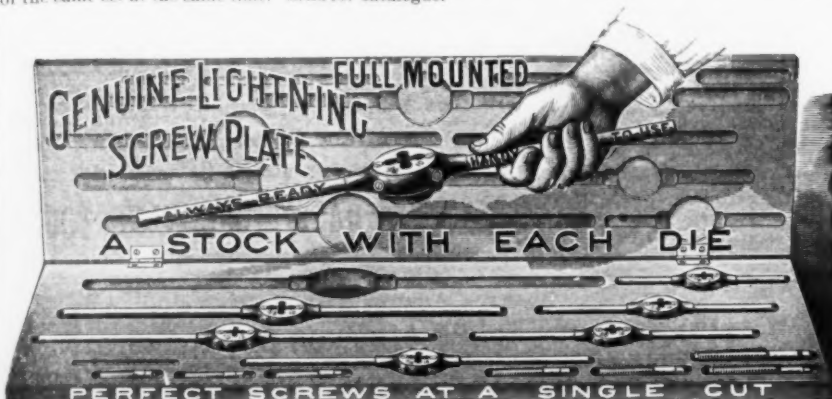
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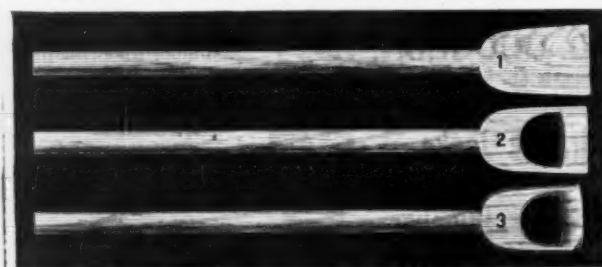
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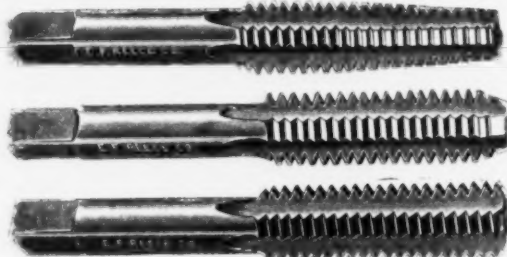
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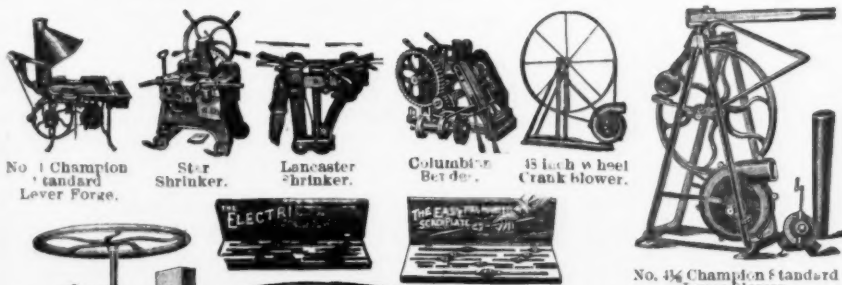
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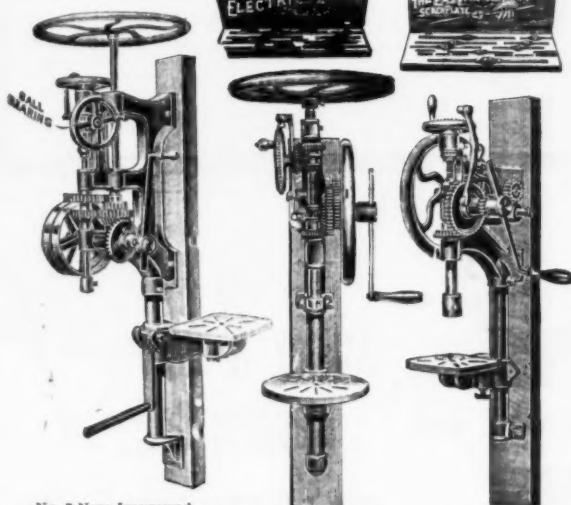
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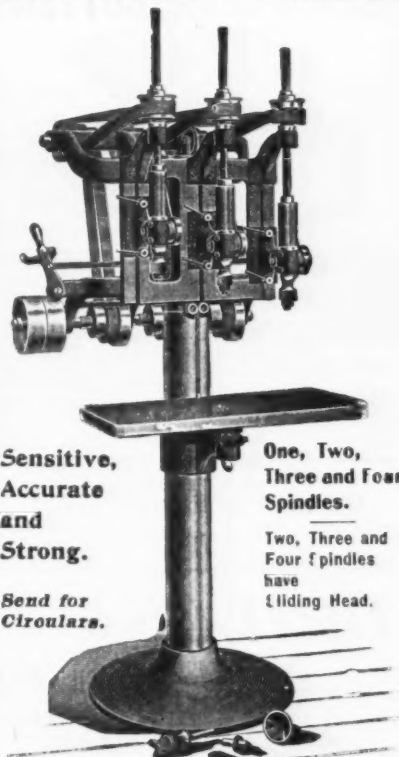
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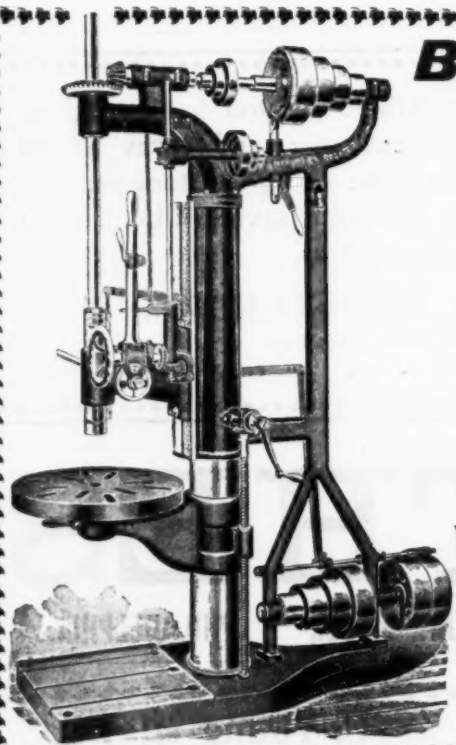
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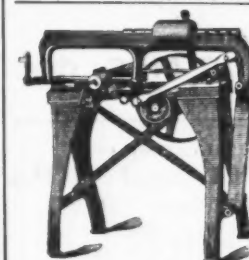
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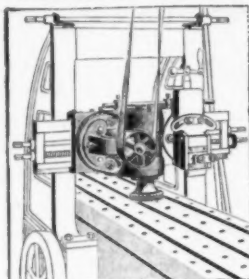
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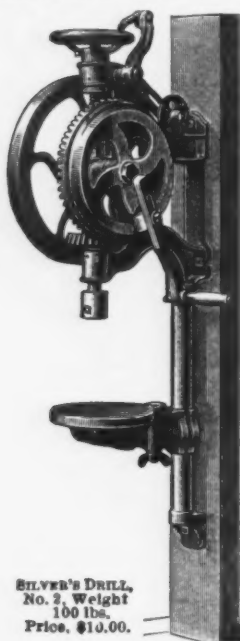
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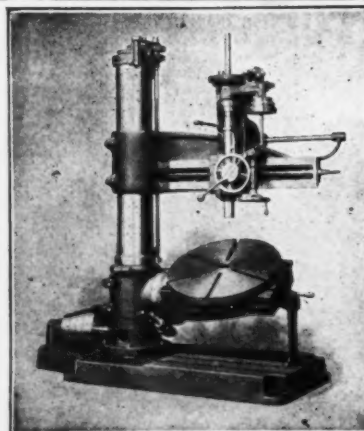
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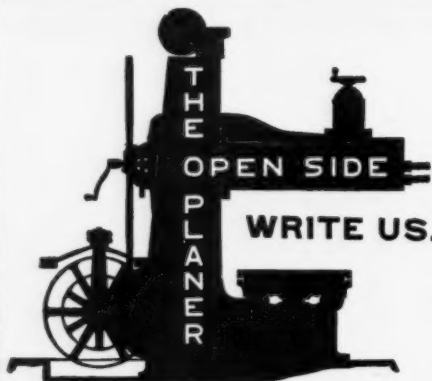
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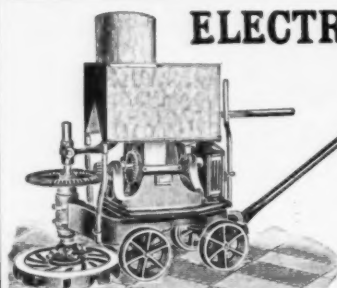
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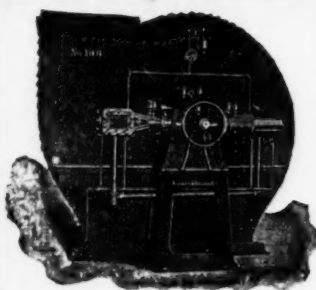
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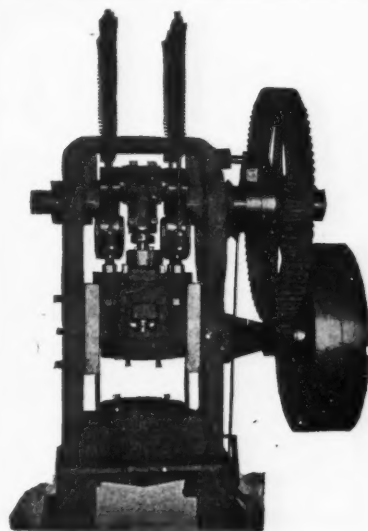


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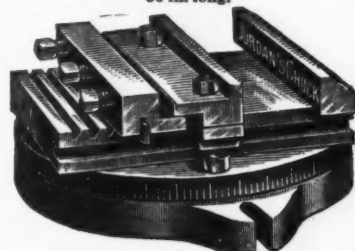
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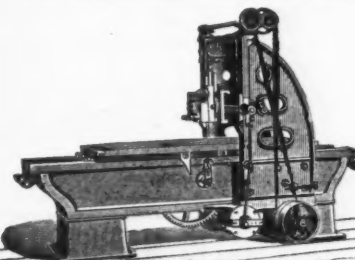
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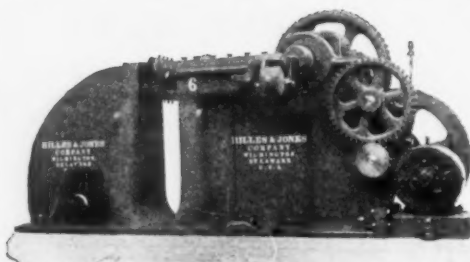
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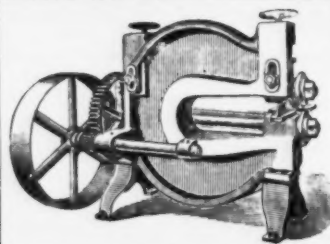
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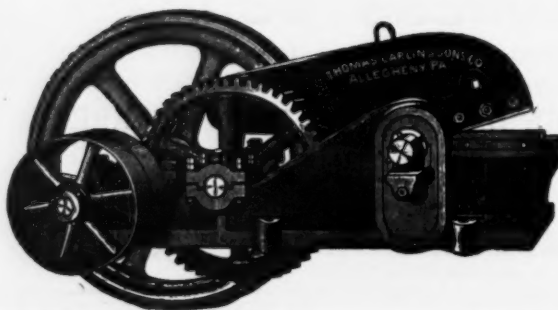
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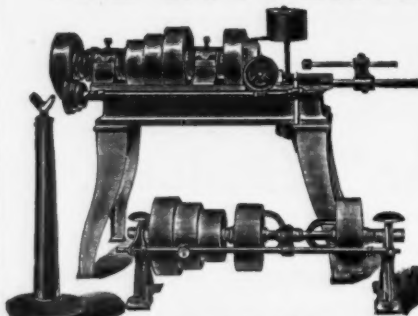
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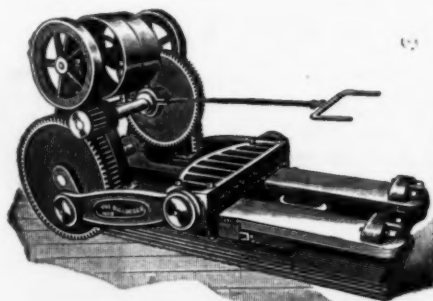
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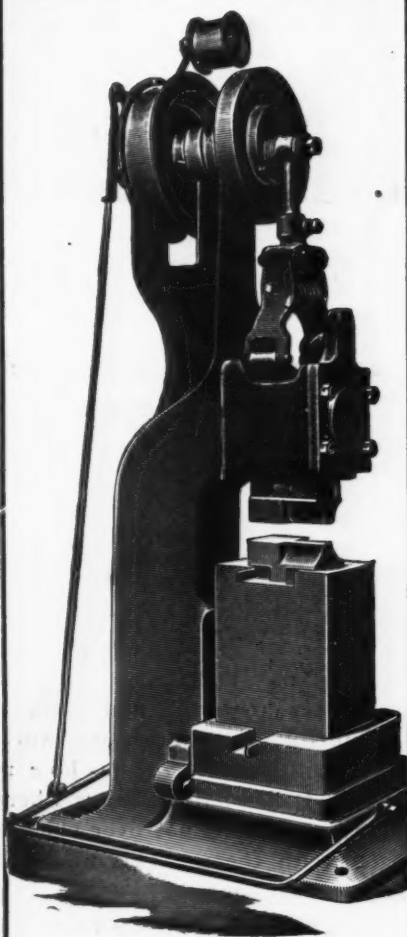
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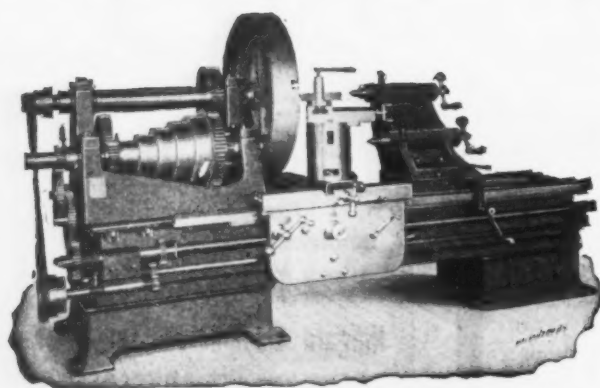
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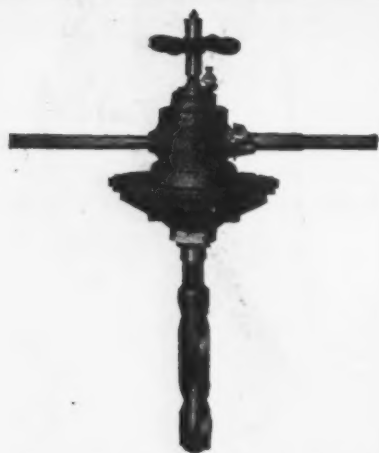
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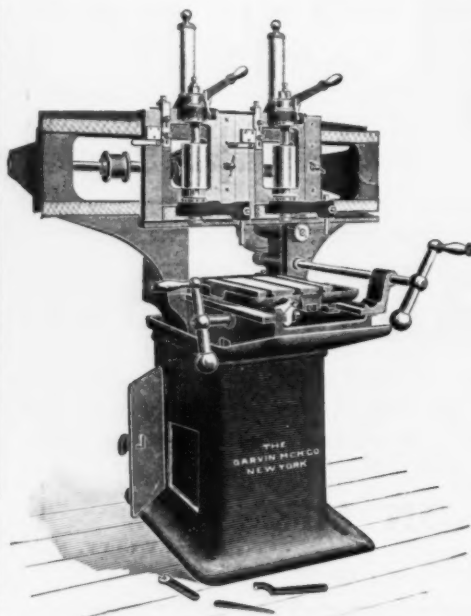
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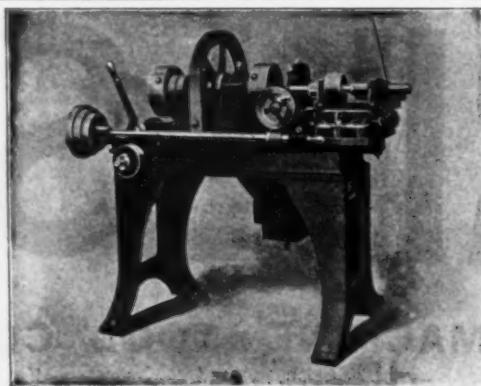
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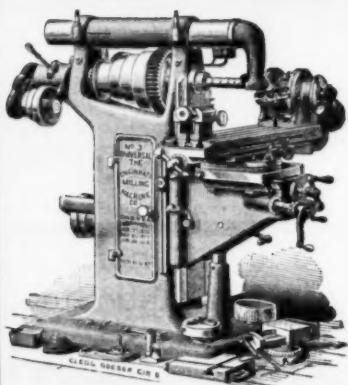
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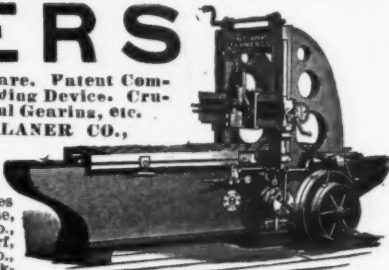
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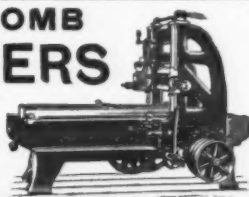
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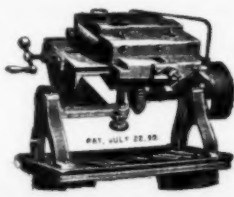


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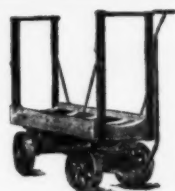
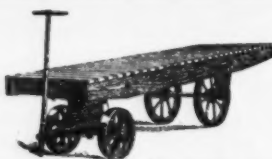
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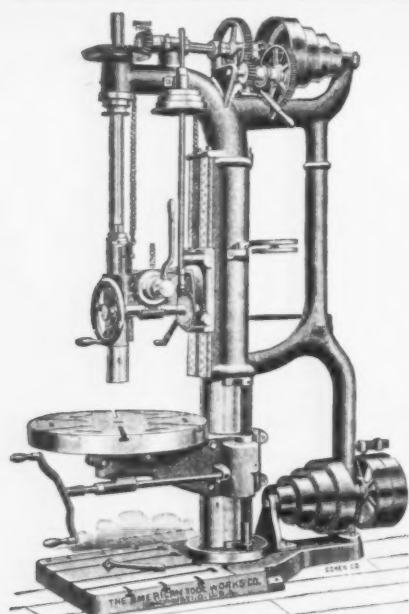
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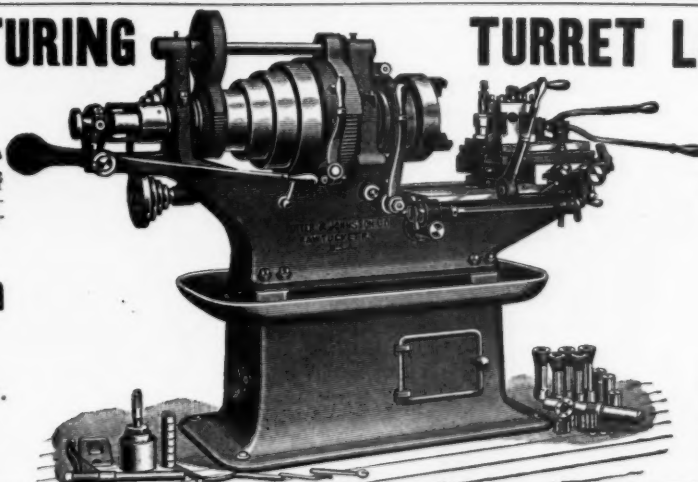
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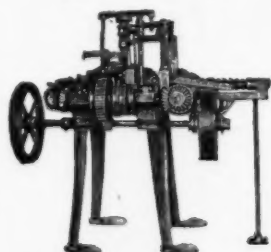
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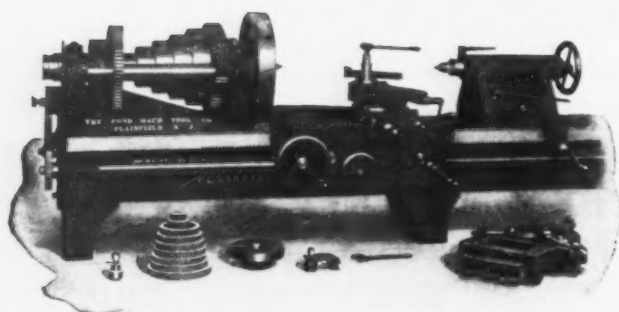
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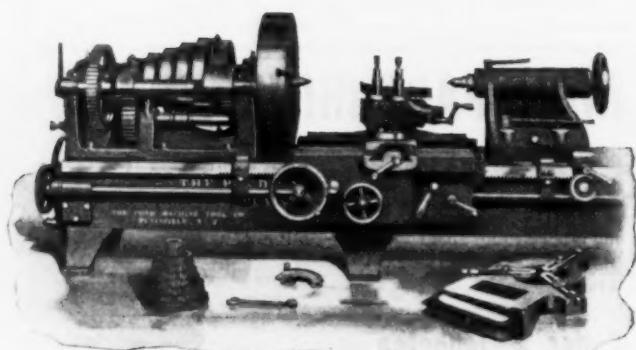
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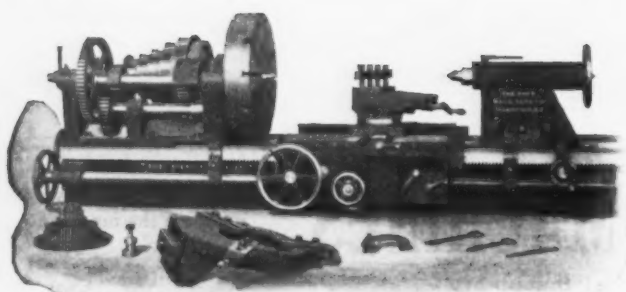
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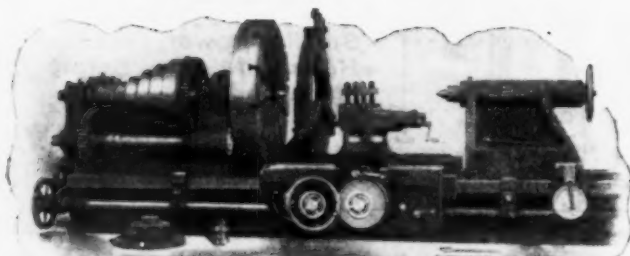
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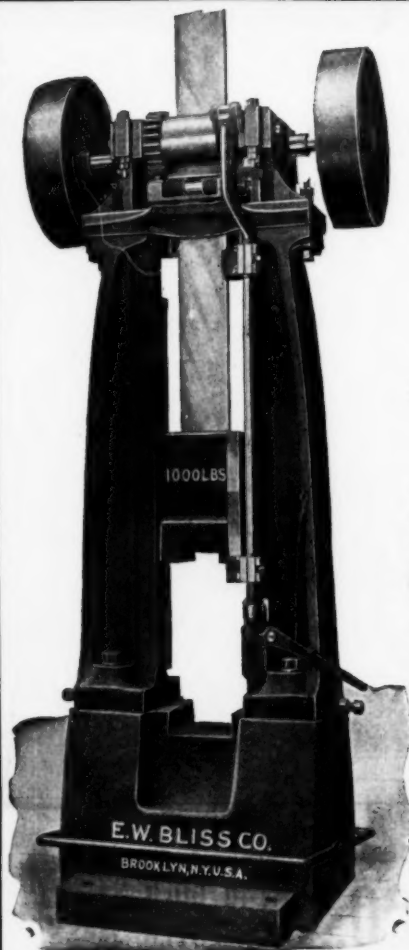
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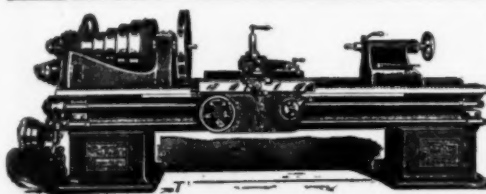
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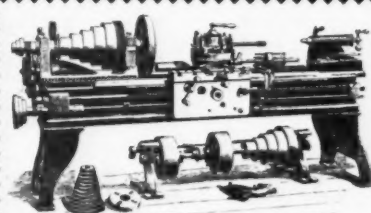
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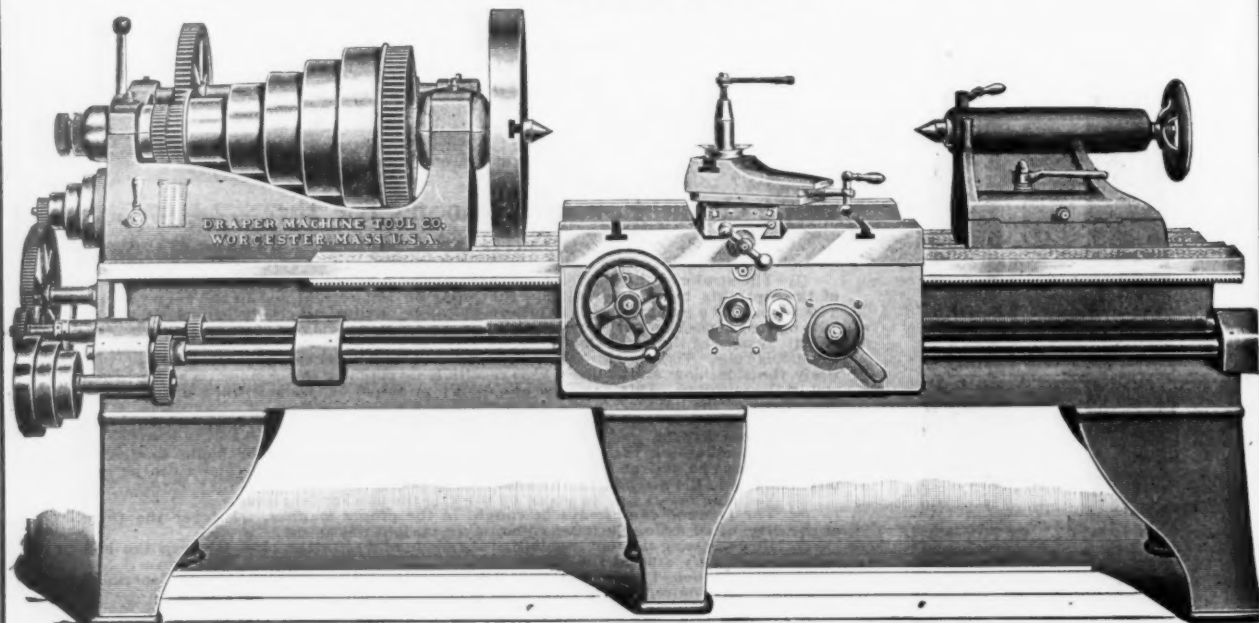
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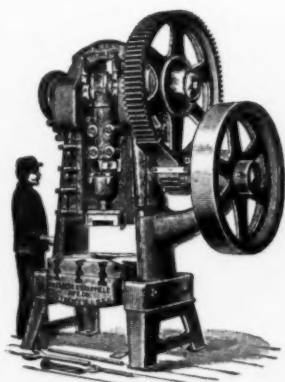
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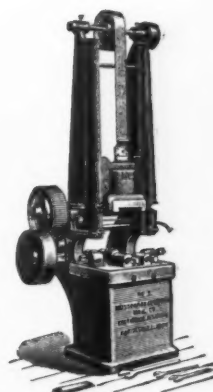
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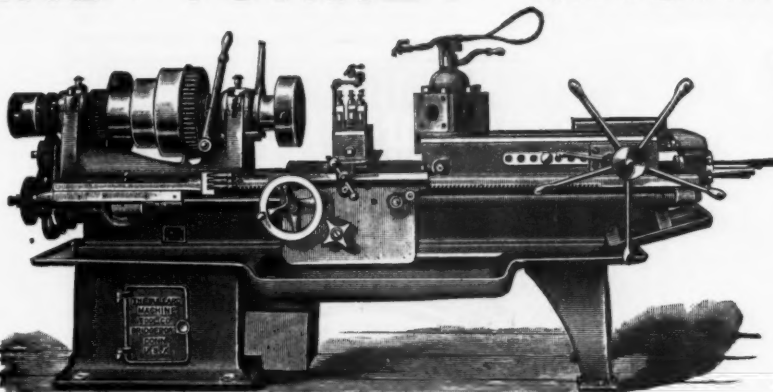
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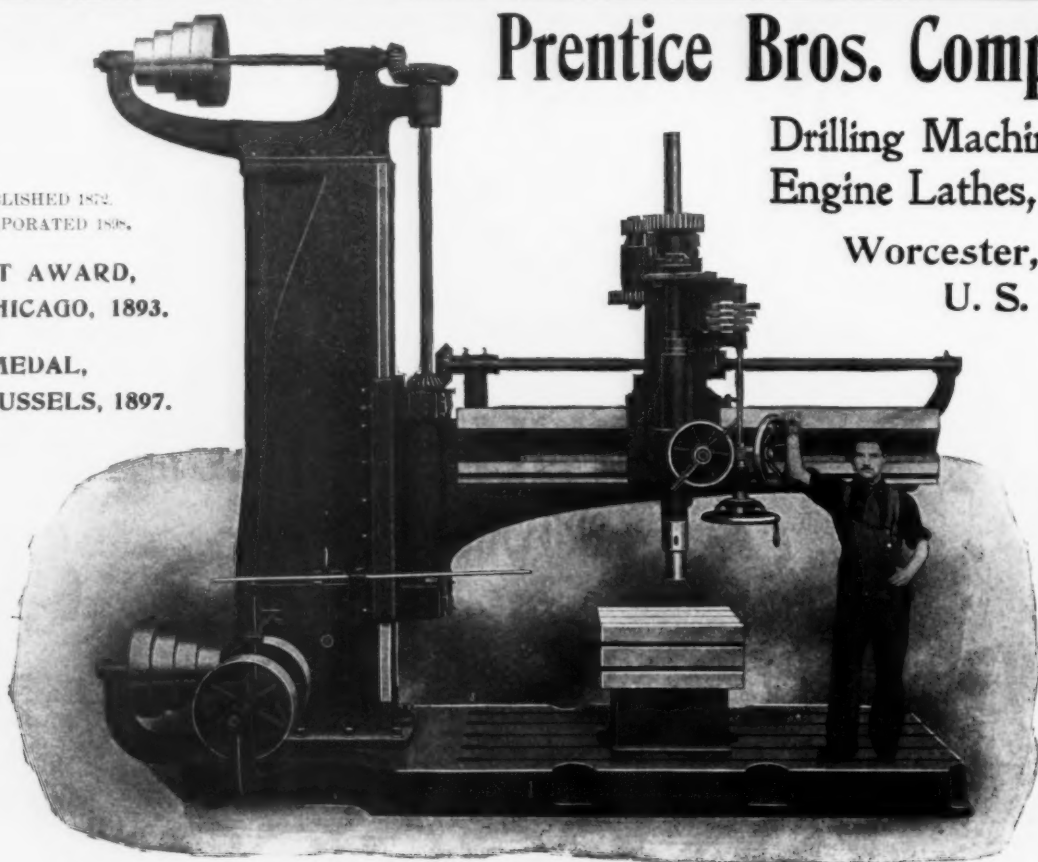
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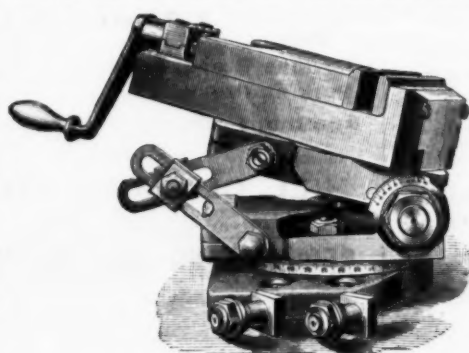
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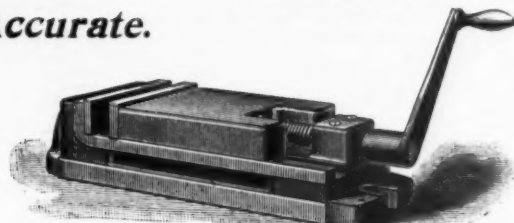
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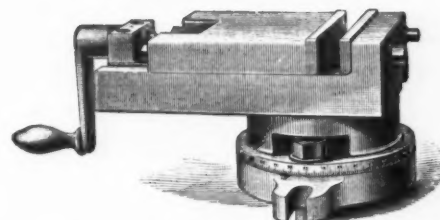
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42 in. x 14 ft. Gleason, 1 head.  
38 in. x 16 ft. Betts, 1 hd., extra heavy.  
36 in. x 12 ft. Pond, 2 heads.  
32 in. x 10 ft. Pond, 2 heads, heavy pattern.  
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30 in. x 10 ft. Gleason, 1 head.  
26 in. x 7 ft. New Haven.  
24 in. x 7 ft. Wheeler.  
22 in. x 5 ft. Flather.  
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14 in. Fitchburg, trav. hd., 28 in. feed, complete.  
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60 in., double head, Eilers & Co., upright.

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28 in. x 60 in. Hamilton Corliss.  
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22 in. x 48 in. Hamilton Corliss.  
22 in. x 42 in. Wright four-valve automatic.  
20 in. x 48 in. Wheelock Corliss.  
20 in. x 42 in. Putnam four-valve automatic.  
16 in. x 16 in. Cooper high speed automatic.  
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15 1/2 in. x 28 in. x 15 in. A & S Cross Cpd. auto.  
14 1/2 in. x 15 in. Armington & Sims automatic.  
12 in. x 83 in. four-valve Putnam automatic.  
12 in. x 16 in. Bass high speed automatic.  
12 in. x 12 in. Phoenix high speed automatic.  
11 in. x 20 in. Rice high speed automatic.  
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Built by W. P. Davis and in thorough good order.  
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2100 Horse Hx. Tubular Manhole under tubes.  
1 125 " " " "  
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120 K. W. Bi-polar Edison.  
Large assortment of high grade Worthington Pumps.  
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25 Tanks, assorted, 6-10 to 1000 gallons.  
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Vertical Boilers 8 to 50 H. P., second-hand.  
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Above tools and others at a bargain.  
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**SPEED LATHES.**

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 Two 20-ton Hand Traveling Cranes, 55 ft. 10 in. span.

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For Sale. 50 H. P. Westinghouse 9 x 15 x 9 Compound Engine and 35 Arc Light Thomson-Houston Dynamo, with Spare Armature, also 25 H. P. Westinghouse Engine. All in first-class order and cheap.

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 1 16 in. x 24 in. Crank Planer.  
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 1 48 in. Bement Boring Mill.  
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36 in. x 72 in. Providence Corliss Rolling Mill Engine, wheel 36 ft. in dia., about 50 tons; engine left hand.  
 Pair of 32 in. x 40 in. Watts Campbell Corliss Engines, with wheel 26 ft. in dia., 11 1/2 in. face, for three belts, shaft 20 ft. long, 16 in. in dia. in the journals, 18 in. dia. in the body, with Jet Condenser, Bucket Plunger Air Pump driven from Crank Pin.  
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 Lot of good 6 in. Pipe.  
 Jet Condensers, Elevators, Dynamos and Pumps.  
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One 10 x 24 Corliss Engine. Also one No. 10 Davidson Steam Pump.

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1 28 x 30 horizontal piston valve engine, with 16 ft. band wheel in halves.  
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Engines and boilers, all styles and sizes, both new and second-hand, machinery of every description for all purposes. Write to me for anything you want  
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**850 HORSE POWER**  
**HEINE**  
**WATER TUBE**  
**BOILERS,**  
 TWO 350 H.-P. UNITS.  
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Complete with McClave Shaking Grates, Breeching, full set of fixtures and trimmings.

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Eight 44 x 16 Tubular Boilers, 32 4 in. flues, all fixtures and trimmings.

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One right hand Wetherill Corliss Engine, cylinder 28 x 60; flywheel 20 feet diameter, weight 30 tons; shaft 15 in. x 13 ft. 6 in.; rope drive pulley 18 ft. diameter and grooved for 15 2-inch ropes; driven wheel 78 in. diameter grooved for 13 2-inch ropes; two iron idlers with boxes complete. With or without Independent Condenser 10x14x16.

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**"As Good As New." Boilers.**

2 250 H. P. Sterling Water Tubes for 150 lbs.  
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 14 in. & 24 in. x 4 in. Comp'd Westinghouse.  
 11 in. & 19 in. x 21 in. Tandem Buckeye.

2 600 H.-P. Snow Condensers.  
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Two New Return Tubular Boilers, 125 H. P. each built by Wetherill & Co.  
 500 ft. 12 inch Cast Iron Bell Pipe.  
 Several large Iron Tanks, round and square.  
 300 New Sugar House Wagons.

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17 ft. Bement Boring Mill  
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12 ft. Knowlton vertical boring and turning mill, good as new.  
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56 x 14 Nicholson & Waterman horiz boring machine new.  
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42 x 36 x 12 Cincinnati ditto, 2 hds., new.  
33 x 33 x 10 Cincinnati ditto, new.  
30 x 30 x 14 Cincinnati ditto, new.  
30 x 27 x 8 Reece ditto, new.  
22 x 22 x 5 L. W. Pond ditto, new.  
68 x 28 Fifield trip. gd. lathe, new.  
42 x 16 & 18 ft. Lodge & Shipley ditto, new.  
38 x 23 Fish triple gd. ditto, new.  
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32 x 18 & 22 ft. Fay & Scott lathes, new.  
31 1/2 x 12, 14 & 6 ft. Davis lathes, new.  
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16 in. stroke Bement Miles slotter, good as new.  
20 ft hydraulic ship keel bending machine, fine order.  
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Also large stock of other tools. Send for complete list.

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## FOR SALE.

New 12 in. x 12 in. Armington & Sims Engine (75 horse power), latest type, self oiling, Rites governor, direct connected, or if belted driving pulley to suit. Delivery at once. Price will interest.

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**A. B. PITKIN MACHINERY CO.**  
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1 1/2 x 5 P. G. R. Davis Lathes.  
1 1/2 x 5 C. P. R. " "  
7 1/2 x 5 R. & F. R. " "  
3 1/4 x 6 P. G. R. " "  
1 1/4 x 8 R. & F. R. " "  
1 1/4 x 8 C. P. R. and taper attach., Davis Lathe.  
1 1/4 x 6 R. & F. R. " "  
3 1/2 x 6 P. G. R. " "  
1 1/2 x 6 C. P. R. & " "  
1 1/2 x 8 C. P. R. & " "  
1 24 x 12 New Pattern, Extra heavy Davis Lathe.  
1 30 x 12 Davis Lathe.  
1 30 x 14 " "  
1 30 x 16 " "

6 3 inch Cutting off Machines on legs.  
4 3 inch " " on Cabinet Base, improved.

11 No. 1 Davis Keyseaters.  
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We can furnish photos or circulars for any of the above tools.

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6 45 K. W. Edison bi-polar, shunt dynamos 125 volts. Central Station headboards.  
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3 15 x 14 Ideal Engines.  
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1 14 1/2 x 15 McIntosh & Seymour Engine  
1 14 1/2 x 18 " " "  
1 10-0 H. P. Austin Open Hot Water Heater.  
2 7 1/2 x 5 x 6 Worthington Duplex Feed Pumps.

Above apparatus can be inspected under operating conditions at Rockford Edison Co.'s plant. Write us for close figures.

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42 inch Schellenback Pulley Lathe, Bores and turns simultaneously.

Portions of three shops for sale.

Write us your wants.

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Engine Lathes, 10 in. to 32 in. swing.  
Speed Lathes, 10 in. to 20 in. swing.  
Shapers, 10 in. to 26 in. stroke.  
Planers 20 in. to 34 in.  
Drill Presses 10 in. to 28 in.  
Milling Machines. Hand and Power.  
Screw Machines and Monitor Lathes up to 30 in.  
Feed and Power Presses, a variety of sizes.  
Drop Hammers with and without automatic lifts.  
Hurlburt & Rogers Cutting-off Machines.

Send for catalogue of Presses

**The Danielson Machine & Tool Co.,**  
CLEVELAND, O.

## FOR SALE OR EXCHANGE.

No. 5 Bardons & Oliver Screw Machine, good as new, \$600.00. Has all cuts, attachments and forming tool slide.  
16 1/2 x 32 Allis Corliss, box bed type; right hand, 10 years old, used very little and overhauled, \$800.00.  
32 x 16 Full Flush Front Boiler, 130 lbs. test, complete, \$254.00.  
1 1/2, 2, 3, 4, 5, 6, 7, 8, 10 H.P. Old Gas Engines. New, all sizes.  
2, 3, 4 H.P. Second-hand Rollers and Engines, cheap.  
Large Paper Cutter, Gauge Lathes, Motors, etc.  
**MILWAUKEE MACHINERY CO.,**  
121 W. Water St., Milwaukee, Wis.

## FOR SALE.

### IMMEDIATE DELIVERY.

One 10 x 12 30 in. gauge Locomotive.  
Contractors' Plan for sale or rent, consisting of one Marion Steam Shovel, two 36 in. gauge Locomotives, thirty 46 in. 3 yard Dump Cars and quantity of 35 and 60 lb. Steel Relays with fish plates. **GRANT & WILLIAMS,**  
333-334 Park Row Bldg., New York.

### CONTENTS OF

## Portsmouth Mach. Co.'s Plant

### FOR SALE.

Consisting of machinery with fixtures, small tools, foundry equipment, patterns, shafting and belting, in good order and condition and used in the manufacture of Plumbers' Brass Goods; outfit complete, sufficient to engage 60 men. Can be used where they now are with low rent or will sell in lots to suit. All correspondence sent to S. T. LUND, 77 Oliver St., Boston, Mass.

## FOR SALE.

A number of 60 x 18 ft. Tubular Boilers. In good condition for immediate delivery.  
**ARMOUR & CO.,**  
205 La Salle St., Chicago.

## SPECIAL BARGAINS SECOND-HAND TOOLS.

**LATHES.**  
1 11 x 5 Prentice Bros.  
1 11 x 4 Prentice Bros.  
1 14 x 4 ft 6 in. Putnam.  
1 14 x 5 Putnam  
1 16 x 6 Keel  
1 16 x 6 Pratt & Whitney.  
1 16 x 6 Brown.  
1 16 x 6 Ames.  
1 16 x 6 Harrington.  
1 16 x 8 Somerset  
1 17 x 6 Tm Gleason  
1 18 x 6 Fuller  
1 18 x 6 McMahon  
1 18 x 6 Pratt & W., Plain  
1 18 x 7 Pratt & W., Plain  
1 18 x 8 Pratt & W.  
1 18 x 10 Am. T. & Mch Co.  
1 18 x 12 Keel  
1 20 x 7 Pratt & W., Plain  
2 20 x 8 McMahon.  
2 20 x 8 Stover  
1 20 x 8 Bullard  
1 20 x 10 B'p's Chocking  
1 21 x 8 Dustin & Hubbard.  
1 26 x 12 Lathe & Morse  
1 28 x 14 Ames.  
1 30 x 17 Pond.  
1 32 x 14 Pond  
1 34 x 19 Freeland.  
1 Bement Single Axle Lathe  
**PLANES.**  
1 16 x 18 x 3 ft 6 in. Putnam.  
1 24 x 24 x 6 ft Putnam.  
1 26 x 26 x 6 ft. N. Y. Steam Engine Co.  
1 6 x 60 x 20 ft Pitchburg  
**DRILLS.**  
1 3 Spindle Ames.  
1 3 Spindle Garvin.  
1 3 Spindle W. & H.  
1 3 in. Practice leverfeed  
1 3 in. Weeks & Halsey  
1 3 in. New Haven  
1 No. 3 Dattlett, Portable.  
1 Bement & D Upright  
**SHAPERS.**  
1 9 in. crank Bement.  
2 15 in. Eric. Bentley.  
1 15 in. Crank, Prentiss.  
1 20 in. Eric. Putnam  
If you want to buy or sell let us know.  
Send for Special List.

**MANNING, MAXWELL & MOORE,**  
85-87-89 Liberty St., N. Y. City.  
Branches at Chicago, Pittsburgh and Cleveland.

## FOR SALE—BARGAINS. NOTE REDUCTIONS.

"Crosby" 2 column Screw Press, heavy.....\$60  
50 H. Horizontal Tubular Boiler guaranteed.....25  
30 H. Austin Feed Water Heater.....120  
100 H. Receiving Tank (150 lbs. test).....60  
10 H. Charter G's Engine, A1.....200  
10 H. Upright 100 Rank Engine new.....70  
15 H. Submerged Flue Upright Boiler.....70  
No. 1 "Starveant" Blower, new.....14  
Pendulum Fo-t Press.....25  
Slate sensitive Drill and Chuck.....25  
16 in Upright Drill Press.....15  
2 in. x 20 in. x 4 ft Iron Planer, not comp etc.....80  
12 H. Kimble automatic Upright C. C. Engine.....80  
10 H. "Eric City" Upright Boiler, complete.....75  
15 H. Upright Boiler, complete with fittings.....50  
"Diamond" Emery Grinder.....12  
4 ft x 15 in Planer Chuck, heavy.....15  
Large stock of Tanners' Tools and Machines constantly on hand  
Send for discounts.

**PARADOX MACHINERY CO.,**  
181 E. Division St., Chicago.

## FOR SALE.

New 8 1/2 x 10 in. Double Cylinder, Double Drum, 4 spool Erectors' Engine with Boiler.  
2 6 1/2 x 10 Double Cylinder, Double Drum Engines with Boiler (new).  
New 6 1/2 x 8 Double Cylinder, Double Drum with Boiler.  
New 18 H.P. Double Drum Erectors' Hoist.  
New Double Drum Belt Hoist.  
6 x 8; 7 x 10; 7 x 12 Carlin, Munday, and Lidgerwood Hoists, Double Cylinder, Double Drum, with Boilers.  
6 1/2 x 10 and 8 1/2 x 10 American and Lidgerwood Single Cylinder, Single Drum Hoists, with Boiler.  
Several Boston, Bacon, O. & S., and other Hoisting Engines.  
Pair 12 x 24 in. Double Cylinder, Double Drum, Tail Rope Haulage Engines.

## BOILERS.

125, 75, 35, 25, 15, and 10 H.P. Portable.  
5 60 in. x 16 ft.  
1 60 in. x 14 ft.  
1 44 in. x 10 ft Horizontal Tubular.  
125, 40, 30, 25, 20, 15 H.P. Vertical.

## ENGINES.

14 x 42, 14 x 24, 14 x 16, 12 x 15, 10 x 12, 9 x 14, 9 x 12, 8 x 12, 8 x 10, and smaller Horizontal Engines.  
17 New and Second-hand Steam Pumps.  
10 Horizontal and Vertical Centrifugal Pumps.  
Derrick and Derrick Fittings.  
Write for the Little Journal that is published every once in a while by

**CARLIN MACHINERY & SUPPLY CO.,**  
JOHN H. CARLIN, Prop.,  
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## INVESTMENTS

Are offered by J. H. Hillman & Son, Empire Building, Pittsburgh, Pa., in the following first-class properties:

### BLAST FURNACES IN PENNSYLVANIA.

No. 1, capacity 300 tons daily, now running, making over \$5 per ton profit. Can be turned over promptly. Will pay half the cost this year.  
No. 2, capacity 200 tons daily, now running with big profit.

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Ready for operation August 1st.

### TWO HUNDRED COKE OVENS AND Five Thousand Acres of Coal Lands in West Virginia.

### FIFTY COKE OVENS AND COAL Lands on the Main Line of Pennsylvania Railroad.

### CONNELLSVILLE COAL LANDS and Coke Ovens.

### EIGHTY COKE OVENS AND CONNELLSVILLE coal in Connellsville region.

### FIFTY THOUSAND ACRES OF COALING coal adjoining Connellsville region. Nine foot vein in Fayette and Greene Counties, Pa. These lands offer the best investments now before the American public.

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Capacity 125,000 tons per annum. Now shipping East and West. Modern electric equipment. Coal is like Pocahontas smokeless used in the United States Navy. Being exported.

### FIFTY THOUSAND ACRES OF KENTUCKY Coal and Timber Land At a low price.

### WELL-KNOWN IRON PROPERTY IN Kentucky

With well-developed ore mines and millions of tons of ore in sight and has also a large number of farms on the Cumberland and Tennessee Rivers. This property contains 40,000 acres and is a principal in itself.

### MANUFACTURING PROPERTY IN the Monongahela Valley.

### THICK VEIN COAL IN THE MONONGAHELA Valley.

In the 3d, 4th, 5th, 6th and 7th pools of the Monongahela River.

### SOMERSET COUNTY COAL LANDS.

In tracts of five, ten, twelve and seventeen thousand acres each, are cheap and are being sold rapidly to Eastern capitalists.

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### CANADIAN IRON ORE MINES IN Operation.

### A MODERN ROLLING MILL.

### MANUFACTURING PROPERTIES and sites in Pittsburgh and Allegheny Cities, Pa.

### FIFTEEN THOUSAND ACRES OF coal in Centre and Clinton Counties, Pa., on the Beech Creek Railroad, suitable for shipment East.

### TEN THOUSAND ACRES OF COAL on the main line of the Pennsylvania Railroad, containing four veins of coal, mostly above water. John Fulton, Mining Engineer of Johnstown, Pa., estimates over 80,000,000 acres of coal on this property. Will be sold cheap to a prompt buyer.

### GLASS SAND PROPERTY, NEAR Birmingham, Ala. 220 acres of property containing most excellent glass sand, on four trunk lines of railroad, near Birmingham, Ala. Will be sold for a reasonable price.

For full information address

**J. H. HILLMAN & SON,**  
Empire Building,  
PITTSBURG, PA.

## For Sale.

Pair 14 x 36 Harris-Corliss; 24 x 56 Watts-Campbell; 13 x 12 and 2 11 x 12 New York safety. 100 H. P. M. P., 3 800, 300, 150, 50 light dynamos. 2 20 H. P. crane motors, speed 500. 15 H. P., 220 volt motor, slow speed. 4 Sturtevant exhausters, 3 Buffalo blowers. Steam shovel, hoisting engine, crushers, coal mining machinery and contractors' equipment. SEND DESCRIPTION any machinery wanted or for sale.

CHESLEY MACHINERY CO., Havemeyer Bldg., N. Y.

## FOR SALE.

Toe Oak Manufacturing Plant, fully equipped and Machines fully covered by patents.  
Address "P," care The Iron Age  
70 Kilby St., Boston, Mass.

## For Immediate Delivery.

**PLANERS.**  
36 in. x 36 in. x 10 ft. Cincinnati, two heads.  
36 in. x 36 in. x 14 ft. Cincinnati, two heads.  
30 in. x 30 in. x 8 ft. Pond, one head.  
36 in. x 36 in. x 8 ft. Pond, two heads.  
36 in. x 36 in. x 10 ft. Pond, three heads.  
36 in. x 36 in. x 14 ft. Pond, one head.

**BORING MILLS**  
37 in. Bullard, two heads.  
60 in. Bullard, two heads.

**ENGINE LATHES.**  
16, 18, 20, 27 in., Lodge & Shipley.  
14, 16, 18, 20 in., LeBlond.  
30 x 26 Shafting Lathe.

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No. 1 Bickford, Tapping.  
No. 2 Bickford, Semi-universal.  
No. 3 Bickford, plain.  
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**UPRIGHT DRILLS.**  
30 in. Hoefler.  
35 in. Hoefler.  
28 in. Snyder.  
32 in. Gould & Eberhardt.  
38 in. Cincinnati.

**MILLING MACHINES.**  
No. 0 plain, Cincinnati.  
No. 1 plain, Cincinnati.  
No. 3 plain, Cincinnati, all feeds.  
No. 2 Universal, Cincinnati, all feeds.  
No. 3 Universal, Cincinnati, all feeds.

**GEAR CUTTERS.**  
33 in. x 9 in. Gould & Eberhardt.  
50 in. Gould & Eberhardt.

A complete line of Screw Machines, Brass Lathes, Fox Monitors, Small Lathes, Grinders and other tools.

Be sure and obtain our prices before purchasing.

**Marshall & Huschart Machinery Co.,**  
62-64 S. Canal St., Chicago, Ill.

19 S. Water St., Cleveland, O.  
510 Johnson Bldg., Cincinnati, O.

## PARTIAL LIST OF Second-hand Machinery IN STOCK.

1 50 H. P. 40 in. x 16 ft. Tubular Boiler.  
2 125 H. P. 66 x 18 Tubular Boilers.  
1 60 H. P. Locomotive Boiler.  
1 150 Buckeye Automatic Engine, size 15x18.  
1 125 Buckeye Automatic Engine, size 14x15.  
1 100 H. P. Ball Automatic Engine, size 13x12.  
1 No. 12 Morris Centrifugal Sand Pump, direct connected to 12 in. vertical engine.  
2 No. 6 Morris Centrifugal Sand Pumps.  
1 16x10x10 Worthington Duplex Pump.  
1 12x12x10 Worthington Duplex Pump.  
1 12x12x10 Worthington Duplex Pump.  
1 7x4x10 Worthington Duplex Pump.  
1 6 x 4 x 6 Deane Pump.  
1 Deane Duplex Power Pump, 5 in. plungers.

**RAINIER & WILLIAMS,**  
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## FOR SALE—STEEL WORKS.

LOCATED ON TWO TRUNK LINES WITH RIVER FRONT.

10 ton Open Hearth Furnaces.  
18-in. Train, with Engine.  
16-in. Train, with Engine.  
Boilers, Gas Producers, Heating Furnaces, Shears, Saws, and Machine Shop for repairs.  
Plant can be run immediately BARGAIN.

**W. J. CARLIN COMPANY,**  
610 and 611 Lewis Bldg., Pittsburg, Pa.

NEW YORK OFFICE:  
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## BLOOMING MILL FOR SALE.

One 32 in. Reversing Blooming Mill with pair of 28 x 48 in. engines; also live tables, table engines, hydraulic manipulator, etc., built by Mackintosh, Hemphill & Co.

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610-611 Lewis Bldg.,  
Pittsburg, Pa.  
NEW YORK OFFICE:  
514-515 Park Row Bldg., New York, N. Y.

## 2d-Hand Machinery Bargains.

One 18 in. x 42 in. Watts Campbell and 22 in. x 42 in. Wright Corliss Engines, High Speed Automatic Simple Compound Condensing and Slide Valve Engines; also Blowing Engines, Boilers, Heaters, Pumps, Vacuum Pans, Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery.  
**CHAS. BEHLEN,**  
72 Trinity Place, N. Y.

## FOR SALE.

Two vertical blowing engines, built by Robert Allison, in excellent condition; the following dimensions, 36 in. x 72 in. x 84 in. and 40 in. x 80 in. x 84 in. Address "S. H.," care The Iron Age, 117-119 South 4th St., Philadelphia, Pa.

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8 x 16 Hice Automatic Engine.  
11 x 11 Ide Vertical Engine.  
14 x 14 Sutton Marine Engine.  
14 x 30 Cummer 4-valve Automatic Engine.  
18 x 24 Atlas Automatic Engine.  
16 x 42 Allis Corliss Engine.  
24 x 24 ft. Shafting Lathe.  
70 H. P. Otis Steel Fire Box Boilers.  
200 H. P. Berryman Heater.  
200 H. P. Reynolds Heater.  
200 H. P. Stillwell-Bierce Heater.  
600 H. P. Rowe Feed Water Heater.  
75 feet Double Leather Belt, 22 in.  
90 H. P. Waste Heat, Vertical Boiler.  
The above are all in first class condition and ready for shipment.

**A. L. DAWSON & CO.,**  
27-31 W. Washington St., Chicago, Ill.

## FOR SALE.

### Mill and Contractors' Machinery.

1 25 ton Morgan Square Shaft 50 ft. span traveling crane.  
2 Hydraulic Cranes.  
1 Roll Lathe.  
1 Hydraulic Press.

### Machine Tools For Sale.

1 12 in. Fitchburg Shaper, sliding head.  
1 9 in. Gould Shaper.

### Engines and Pumps For Sale.

1 30 x 36 in. Vertical Corliss Rolling Mill Engine with 20 ft. fly-wheel.  
4 Second-hand Steam Pumps.  
1 Centrifugal Pump.  
1 Second hand Hoisting Engine.  
A full line of New Engines, Hoisting Engines, Shears, Grinding Pans, Stone Crushers and Contractors' Machinery.

**THOMAS CARLIN'S SONS CO.,**  
386 River Avenue, Allegheny, Pa.

## CUPOLAS, CRANES, LADLES BLOWERS,

and all other Foundry Equipment, new and second-hand. Send us list of your wants.

**THE J. D. SMITH FOUNDRY SUPPLY COMPANY,**  
CINCINNATI, O.

## FOR SALE. HYDRAULIC CRANES.

One Hydraulic Crane, Craig Rodgway & Son make, twelve tons capacity, 36 in. cylinder, 24 ft. radius.  
One Hydraulic Crane, Craig Rodgway & Son make, five tons capacity, 12 in. cylinder, 22 ft. radius.

**THE CRANE & BREED MFG. CO.,**  
Cincinnati, Ohio

## 2d-HAND FEED WATER HEATERS.

Largest stock in America. Will be sold at bargains. These heaters are mostly taken in exchange for our improved Berryman (Kelley's Patent) "A Little Giant," vastly superior to all other feed water heaters, both as to results and durability.

**BENJ. F. KELLEY & SON,** 91 Liberty St., N. Y.

## LIGHT PLANT FOR SALE.

One 35 H. P. Fischer C. C. high speed, self-oiling engine, with one 400 incandescent light Tri-umph dynamo with switchboard.

**W. J. CARLIN COMPANY,**  
610-611 Lewis Bldg., Pittsburg, Pa.  
NEW YORK OFFICE:  
514-515 Park Row Bldg., New York, N. Y.

## ENGINES AND BOILERS.

12 x 36 Lane & Bodley Corliss }  
14 x 15 Phoenix Automatic } Engines.  
1 17 Payne "  
14 x 20 Atlas "  
11 x 30 Fitchburg "  
13 x 36 Buckeye "  
and others second hand. Also  
2 66 x 18 Hor. Tubular Boilers.  
2 66 x 16 "  
Send for complete list of second-hand machinery.  
**W. D. NORFOLK,** 8th and Carr Sts., Cincinnati, O.



## For Quick Delivery.

Single Punches and Shears.  
48 in. throat, 1 1/4 in. in 3/4 in.  
36 in. throat, 1 1/4 in. in 1 in.  
Splitting Shears.  
For 3/4 in., 5/8 in. and 1/2 in. plate.  
Double Angle Shear for 4 x 4 x 5/8 in. angles.  
Plate edge Beveling Shear for 3/4 in. plate.  
Guillotine Bar Shear, 17 in. knife, for 2 in. square.  
Gate Shear and Multiple Punch, 78 in.  
Riveting and Punching Press 5 ft. gap.  
Bending Rolls, 12 ft. 2 in. between housings,  
100 in. bet hsgs. for 1 3/4 in. plate.  
Spacing Table, hand, 8 ft.  
Radial Drills, 48 in. and 60 in. arm.  
Boiler Makers' Flanging Clamps, 10 ft.  
Steam Riveter, 6 1/4 ft. gap.  
Duplex Vertical Engines, 9 x 9.  
Plate Planer, 6 ft. cut.

HILLES & JONES COMPANY,  
Wilmington, Delaware.

## Engine Bargains.

1 30 in. x 60 in. R. H. Hamilton Corliss, 15 in. shaft;  
18 ft. fly wheel in 8 sections; rim 12 in x 15 1/2  
in.  
1 18 in. x 32 in. Single Cylinder Link motion Double  
Drum with friction and brake band Haul-  
age Engine, made by Webster, Camp & Lane.  
The above engines are in A No. 1 condition.  
For Sale by  
W. M. C. JOHNSON & SONS MACH'Y CO.,  
St. Louis, Mo.

## SPECIAL BARGAINS.

### Second Hand Machine Tools.

10 in. x 5 ft. Shepherd Foot Lathe.  
18 in. x 6 ft. Sebastian Lathe, compound rest.  
6 in. Pratt & Whitney Shaper, Crank.  
18 in. Ohio " " "  
20 in. Lodge & Davis " "  
30 in. Pond Style Pulley Lathe.  
4 1/2 Brainerd Miller, Plain Head, Automatic Feed.  
26 in. Barnes Drill, complete.  
6 ft. Power Bending Rolls.  
No. 2 wire feed Screw Machine, 15-16 in. capacity  
No. 1 Stiles Sprue Cutter.  
3 in. Cox Pipe Machine.  
Large stock of new Machine Tools

Large stock of new tools, immediate shipment.

### THE FAIRBANKS COMPANY,

901, 703, 705 Arch St., - Philadelphia, Pa.

## FOR SALE.

One 150 H. P. Cross-compound Armstrong & Sims  
Auto. Engine. Cylinders 11 1/4 in. and 18 1/2 in. by  
15 in. stroke.  
One 13 in x 12 in. Phoenix Auto Engine.  
One 12 in x 24 in. Wetherill Corliss Engine  
One 12 in. x 36 in. Babcock and Wilcox Engine.  
One 7 in. x 9 in. Atlas Auto. Engine center crank.  
One 12 in. x 7 in. x 10 in. Duplex Worthington Pump.  
Also a number of smaller Engines and Pumps.  
THE E. H. WATERS CO.  
158 Indiana St., Chicago

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### FOR SALE.

Stamping Works at Cleveland, O.  
Owner will sacrifice owing to ill health.  
Porter Mfg. Co., Syracuse, N. Y.  
Large Engine and Boiler Shops.  
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Present owner will participate in operation.  
Indiana Coal & Coke Co., Indiana, Pa.  
Very complete mining and coke outfit, 600 A.  
laid.  
Bell Soap Wks., Buffalo, N. Y.  
Cheap for quick sale. Now running.  
CEO. H. BOWLER,  
513 Williamson Bldg., 1110 Park Bldg.,  
CLEVELAND, O. PITTSBURG, PA.

## WANTED.

An 18 in. muck and bar train and squeezer and  
a 9 or 10 in. guide mill Address  
SMITH, Box 64,  
care The Iron Age, New York.

## Second-hand Tools For Immediate Delivery.

1 800 lb. Merrill Drop Hammer.  
1 14 in. x 60 in. Pratt & Whitney Shaping  
Machine.  
1 12 in. x 60 in. Bement Shaping Machine.  
1 10 Pratt & Whitney Tool Room Lathe.  
1 No. 3 Stiles Punching Press.  
1 No. 3 Fowler Press.  
1 54 in. x 19 ft. Planer, double head.  
1 60 in. Heavy Radial Drill, 4 spindle.  
1 Small Horizontal Boring and Drilling  
Machine, Bement.  
1 No. 13 Brown & Sharpe Milling Mach.  
1 No. 1 1/2 Pratt & Whitney Hand Milling  
Machine.  
1 No. 2 1/2 Newton Duplex Milling Mach.  
2 No. 5 Cleveland Auto. Screw Machines  
1 Lodge & Davis Screw Machine 2 in.  
1 No. 2 Jones & Lamson Screw Machine.  
2 36 in. Hydraulic Wheel Presses.  
1 16 in. Slotting Machine.

## U. Baird Machinery Co.

123-125 Water St., 124-126 First Ave.,  
PITTSBURGH, PA.

## Heavy Turret Lathe

### We offer for immediate delivery:

1 HEAVY JONES & LAMSON TURRET  
LATHE. 24 in. swing, 8 1/4 ft. b.d. friction geared  
head, 3 1/4 in. hollow spindle, turret, 6 1/4 in. diam-  
eter, has 6 holes 3 7-16 in. diameter, and has power  
feed.  
Machine has had about 6 months' use, and is in  
first-class condition.  
Price very low.

### WILLIAM A. READE & CO.,

Successors to 216-217 American Trust Bldg.,  
Reade & Bowler, CLEVELAND, OHIO.

## FOR SALE.

17 ft. 13 ft. Boring and Turning Lathe.  
12 in. x 8 ft. Engine Lathe.  
2 16 in. x 8 ft. " "  
1 12 in. x 5 ft. " "  
1 12 in. x 4 ft. " "  
1 30 x 3 1/2 x 8 ft. Worcester Mch. Co. Planer.  
1 Fl. ther's in x 6 ft. Monitor Fox Lathe.  
7 Lincoln M'f'rs.  
1 Upright - planing Machine.  
Write for list  
HANNAN & FINTON, Springfield, Mass.

## FOUNDRYMEN.

We have for sale a complete Foundry  
for making Stoves. Will sell whole or part.

The Thomas & Lowe Machinery Co.,  
Providence, R. I.

### FOR SALE OR TO LET.

Drop Forge Works, building 40 x 130 ft., all  
fitted up with modern tools. 3 Drops. 3 Power  
Presses. Machine Shop. Japanning Plant.  
Shears. Brick Boiler House. 2 Steel 40 horse  
power Boilers. 1 50 horse-power Engine. Com-  
plete Oil-Fuel Plant. Side track in yard, no shift-  
ing charges. For information address  
F. A. FISHER, Gloucester, Mass.

### SECOND-HAND.

60 and 80 lb. Bradley Hammers.  
No. 6 Root Blower.  
No. 3 Bell Steam Hammer.

DAWSON & GOODWIN,  
41 So. Canal St., Chicago

## FOR SALE.

1000 dozen brand new single bit axes, all weights  
from 3 1/2 to 4 1/2 lbs., packed one dozen in a  
case, a full assortment of patterns such as  
the Michigan, Kentucky, Yankee, Western,  
Ohio, Dayton, Weege, etc. Price per dozen  
\$4.50.

One carload of cold rolled steel shafting, 1 1/2-16 to  
4 in. Get our complete list and prices.

350 solid steel anvils all sizes, 1000 cast iron  
anvils, all sizes and 1500 wrought steel anvils,  
all sizes

75 dozen regular canal wheelbarrows, some with  
steel and some with wooden wheels. They  
are first-class quality. Write for complete  
description and price

A \$50,000 stock of brand new brass fittings and  
valves.

A complete stock of all sizes in brand new regis-  
ters, vent-lators, faces and borders. Ask for  
our discount.

All kinds of iron and wood split pulleys.  
1000 brand new iron porcelain enameled bath  
tubs.

5,000 Assorted Sinks.

25,000 Lavatories.

6,000 Water Closets.

Plumbing material of all kinds.

1,000 brand new private mail boxes for rural or  
city use

A carload of emery wheels, all sizes

We have a job of brand new padlocks. Get our  
descriptions.

We have the largest machinery depot on earth.

Our plant covers over 10 acres of ground and  
is complete with everything in the machinery  
line. We list a few items that may interest  
you. Further information on application.

1 10 ton Ice Machine in first-class condition. This  
machine is at present set up in our plant, and  
can be inspected. We solicit correspondence.

2 72 x 16 Horizontal Tubular Boilers

2 66 x 16 " " "

4 54 x 16 " " "

2 34 x 15 " " "

1 34 x 14 " " "

2 48 x 16 " " "

1 50 H. P. Fire Box Boiler.

1 35 H. P. " " "

1 20 H. P. Upright Boiler.

2 15 H. P. " " "

1 10 H. P. " " "

1 15 H. P. Combined Engine and Boiler (locomotive).

1 8 H. P. Upright Combined Engine and Boiler.

1 4 H. P. " " "

1 10 H. P. " " "

1 10 H. P. Hoisting Engine and Boiler combined, on  
wheels.

1 8 H. P. Hoisting Engine and Boiler combined, on  
wheels.

1 Locomotive Traveling Crane.

1 18 x 42 Frick Corliss Engine.

1 20 x 32 Watertown Automatic Engine.

1 18 x 28 " " "

1 20 x 24 Plain Slide Valve Engine.

1 14 x 15 4-valve Russell Engine.

1 18 x 18 Center Crank Erie City Engine.

1 14 1/2 x 8 Armstrong & Sims High Speed Automatic  
Engine.

1 12 x 12 Armstrong & Sims High Speed Automatic  
Engine.

1 12 x 12 Ideal High Speed Automatic Engine.

1 10 x 15 Meyers Fixed Cut Off Engine.

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| 64       | 64  | 63 x 61       | 123         |  |  |
| 65       | 65  | 64 x 62       | 125         |  |  |
| 66       | 66  | 65 x 63       | 127         |  |  |
| 67       | 67  | 66 x 64       | 129         |  |  |
| 68       | 68  | 67 x 65       | 131         |  |  |
| 69       | 69  | 68 x 66       | 133         |  |  |
| 70       | 70  | 69 x 67       | 135         |  |  |
| 71       | 71  | 70 x 68       | 137         |  |  |
| 72       | 72  | 71 x 69       | 139         |  |  |
| 73       | 73  | 72 x 70       | 141         |  |  |
| 74       | 74  | 73 x 71       | 143         |  |  |
| 75       | 75  | 74 x 72       | 145         |  |  |
| 76       | 76  | 75 x 73       | 147         |  |  |
| 77       | 77  | 76 x 74       | 149         |  |  |
| 78       | 78  | 77 x 75       | 151         |  |  |
| 79       | 79  | 78 x 76       | 153         |  |  |
| 80       | 80  | 79 x 77       | 155         |  |  |
| 81       | 81  | 80 x 78       | 157         |  |  |
| 82       | 82  | 81 x 79       | 159         |  |  |
| 83       | 83  | 82 x 80       | 161         |  |  |
| 84       | 84  | 83 x 81       | 163         |  |  |
| 85       | 85  | 84 x 82       | 165         |  |  |
| 86       | 86  | 85 x 83       | 167         |  |  |
| 87       | 87  | 86 x 84       | 169         |  |  |
| 88       | 88  | 87 x 85       | 171         |  |  |
| 89       | 89  | 88 x 86       | 173         |  |  |
| 90       | 90  | 89 x 87       | 175         |  |  |
| 91       | 91  | 90 x 88       | 177         |  |  |
| 92       | 92  | 91 x 89       | 179         |  |  |
| 93       | 93  | 92 x 90       | 181         |  |  |
| 94       | 94  | 93 x 91       | 183         |  |  |
| 95       | 95  | 94 x 92       | 185         |  |  |
| 96       | 96  | 95 x 93       | 187         |  |  |
| 97       | 97  | 96 x 94       | 189         |  |  |
| 98       | 98  | 97 x 95       | 191         |  |  |
| 99       | 99  | 98 x 96       | 193         |  |  |
| 100      | 100 | 99 x 97       | 195         |  |  |

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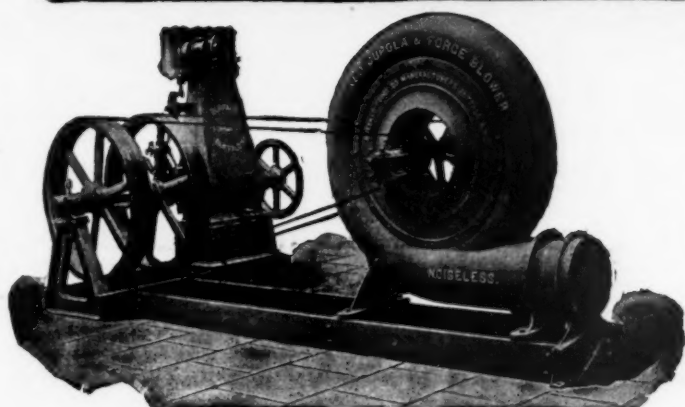
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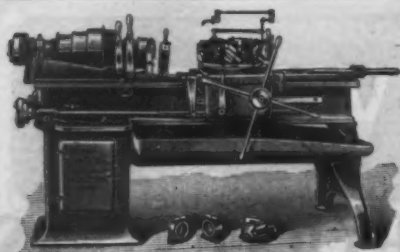
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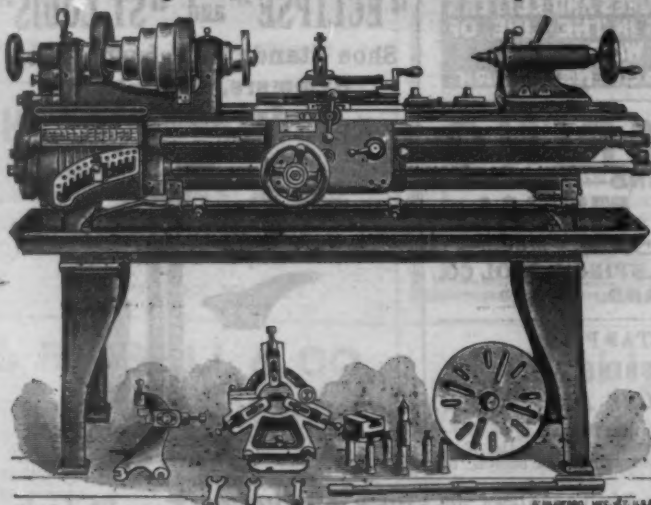
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THURSDAY, JUNE 28, 1900

## The Minette District of Lorraine, Luxemburg and France.—I.

EDITORIAL CORRESPONDENCE.

(With Supplement.)

PARIS, May 28, 1900.—The great rival of the Rhenish-Westphalian iron industry in Germany is the rapidly growing district in Lorraine which depends upon the famous Minette ore, mined in that part of Germany which it conquered in 1870-1871. The Minette bed extends over a part of Luxemburg, an independent grand duchy. Its northern fringe touches Belgium, while its western part stretches far into France. Although the grand duchy of Luxemburg is independent, it has a fiscal

It is difficult to escape the conclusion that the division of the district into practically three areas, by what is after all the accident of boundary lines, has tended to disguise somewhat its magnitude. Other circumstances, too, have contributed to diminish in the estimation of iron makers generally the significance of the developments. The ore is poor, it was only locally worked to a moderate extent, the pig iron made had a poor reputation for foundry and forge purposes, and sold and still sells considerably below the prices paid for other kinds.



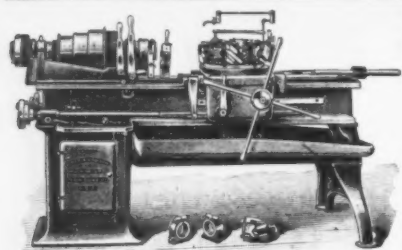
Open Cut Mine of the Société Lorraine Industrielle, Hussigny, France.

### THE MINETTE DISTRICT OF LORRAINE, LUXEMBURG AND FRANCE.

treaty with the German Empire which, as to import duties, makes it, to the outside world, an integral part of that country, and its production of ore and metal is usually credited to Germany in trade statistics. Lorraine, or Lothringen as the Germans put it—nearly every hamlet has its two sets of names—is, like Alsace, imperial territory. It therefore has an administration of its own, a fact which occasionally has its influence upon the conditions surrounding its industries. France has a considerable share of the Minette iron ore area, while Belgium taps the same, through ownership and purchase of ores, to an extent important to its iron trade.

Only a certain amount of it was used in mixture, and that limited its sale. Until lately only a part of the iron made in the district was converted into steel on the spot. Then, after all, it is only in very recent years that the tendency apparent all the world over of the movement of the iron industry away from the colliery toward the iron mine—other factors being equal—has drawn capital on a large scale to the Minette district of Luxemburg, Lorraine and France. The divided sovereignty has, of course, complicated the question and obscures the movement, which, however, is one of the most significant, from an economic point of view, now worthy





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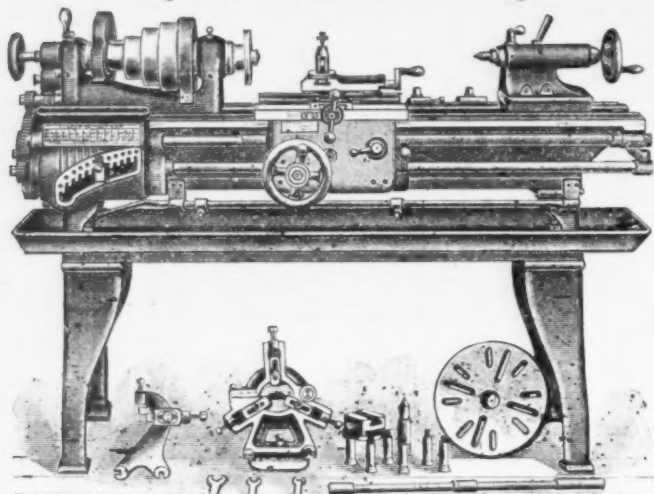
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Only a certain amount of it was used in mixture, and that limited its sale. Until lately only a part of the iron made in the district was converted into steel on the spot. Then, after all, it is only in very recent years that the tendency apparent all the world over of the movement of the iron industry away from the colliery toward the iron mine—other factors being equal—has drawn capital on a large scale to the Minette district of Luxemburg, Lorraine and France. The divided sovereignty has, of course, complicated the question and obscures the movement, which, however, is one of the most significant, from an economic point of view, now worthy



of the study of the iron trade. Nor must it be forgotten that the free play of material factors is interfered with by the fact that the management of the railroads has a decisive voice in the matter, and that it is State management, with its cumbersome methods, which must be taken into account.

Technical reasons, too, as well as economic factors, have a powerful sway in shaping the course of events, and these are just now likely to become very influential.

It is not a mathematical problem pure and simple to determine the location of cheapest assembling of materials with reference to most favorable position as to markets. No one can sit down and figure out where must I haul so many tons of coal or coke, and so many tons of iron ore, at a minimum cost of freight, so that, adding freight on product to market, I reach the lowest figure. The quantity of iron ore is the only one which is not variable. The quantity of fuel, which by the way the majority underestimate, does, through technical improvements, decline every year. Hence the tendency away from the colliery, because the quantity involved declines.

There is a third method, still in use very largely, and notably in the Minette district, and that is the assembling of ore and fuel at one point and the shipment of the pig iron made to another point for conversion into milled products. This it seems likely will first disappear because it means the sacrifice of the saving in cost which grows out of the direct method of running the molten iron from the blast furnace into the converter.

As applied to the Minette ore we have the following:

1. The shipment of the ore to the coal, where the iron and steel works are located. This is what is now going on on a large scale in the case of the Westphalian district, of the Liège district in Belgium, and to some extent in France.

In nearly every case this is supported by the claim that the cars which run empty from the coal mines of Westphalia, &c., ought to be utilized to haul ore back to the coal district.

Then the Minette district, as far as both Germany and France are concerned, is located at one end of the country, away from the chief centers of consumption. In other words, the freight on the three tons of ore is saved, but against that must be counted the freight on the coal or coke, or both, plus the freight on the product, so far as the markets for that product lie beyond, and it must pass through the coal region. This is largely the case in Germany, and to that extent in favor of hauling the ore to the coal.

2. Manufacturing the pig iron at the ore, by transporting the coke there, and conveying the pig to the steel works, located either near the fuel, which need not be coking coal, or near the markets, and above all near a long established skilled working population. This is what has been done to a large extent in the Minette district, the greater part of whose product thus far has been converted either in Westphalia in the Saar district, or in Belgium. In the case of each there is thrown into the balance the very important factor that long established works have gathered around them a working force strongly tied to the locality, and, in the case of Belgium, content with lower wages.

3. Carrying the coke and coal to the ore, smelting there and directly converting the pig iron into steel and rolling it into a full line of products. It is here that technical improvements step in, the latest in particular being likely to contribute in an important degree toward throwing the balance in favor of carrying the manufacture up to the final merchantable product in the ore mining district. First of all, local steel works have the advantage of the saving which grows out of the direct conversion of molten iron from the blast furnace. Second, they are sweeping aside a very serious drawback of a high fuel cost for rolling mill purposes by the direct utilization of blast furnace gas for power through the employment of the gas engine. It is extraordinary to what extent this last development in iron metallurgy is taking hold in the Minette district, where coal is very high. One of the most progressive of the younger generation of German metallurgists, Max Meier, general manager of the new plant at Differdange, states that under the conditions prevailing in Luxembourg and Lorraine the waste gas from a group of five furnaces is capable of furnishing all the power required for a steel plant converting 1000 tons of metal per day, in addition to that needed for the furnace plant. Up to the present that cannot be realized, of course, because certain parts of the rolling mill machinery cannot be driven electrically because of the shocks, nor can some of the incidental reheating be done. Still, a furnace plant of say six furnaces, making 1000 tons per day, would furnish the necessary gas for all power purposes to the finished rolling mill product, and a surplus, if important, might be used to make calcium carbide.

The utilization of furnace gas for driving large unit gas engines may be said to be in its experimental stages

only to this extent, that the selection of the type of engine is still in doubt. The principle itself—that is, the ability to produce large engines which run year in and year out—has been established, but enough experience has not yet been accumulated to judge which of the many now bidding for favor will best meet the requirements of practice. A number of large and reliable concerns on the Continent have already entered the field.

As for the fact that this new departure is bound to play an important part on the Continent and elsewhere, there can be little doubt. Generally speaking it will help in making the steel industry more independent of the fuel and will to that extent aid those who are laboring under the disadvantage of high priced coal.

A few figures may illustrate the position, although they cannot pretend to define exactly the status of each locality. Assuming the waste in conversion from pig to finished rolled product to be 15 per cent., and the ore to yield 31 per cent. of iron, then it will take 3.8 tons of Minette ore to make a ton of finished steel. The freight on ore to Westphalia ranges from 6.30 to 6.50 marks per ton. At the former rate, the freight which the Westphalian steel makers would have to pay would be 24 marks. On the other hand, the steel maker of the Lorraine-Luxemburg district must haul 1.25 tons of coke from the Ruhr district to make a ton of pig iron, on which he pays 8 marks per ton freight, or 10 marks per ton of pig. Add 1.50 marks for waste of pig iron and approximately 8.50 marks freight on finished product to Westphalia, he can reach his competitors at 20 marks. Of course, some of his product goes to neutral markets like those of Southern Germany, and there he has the advantage. It is only fair to note, however, that he must pay freight also on the amount of coal which he still uses and will continue to use in his mill.

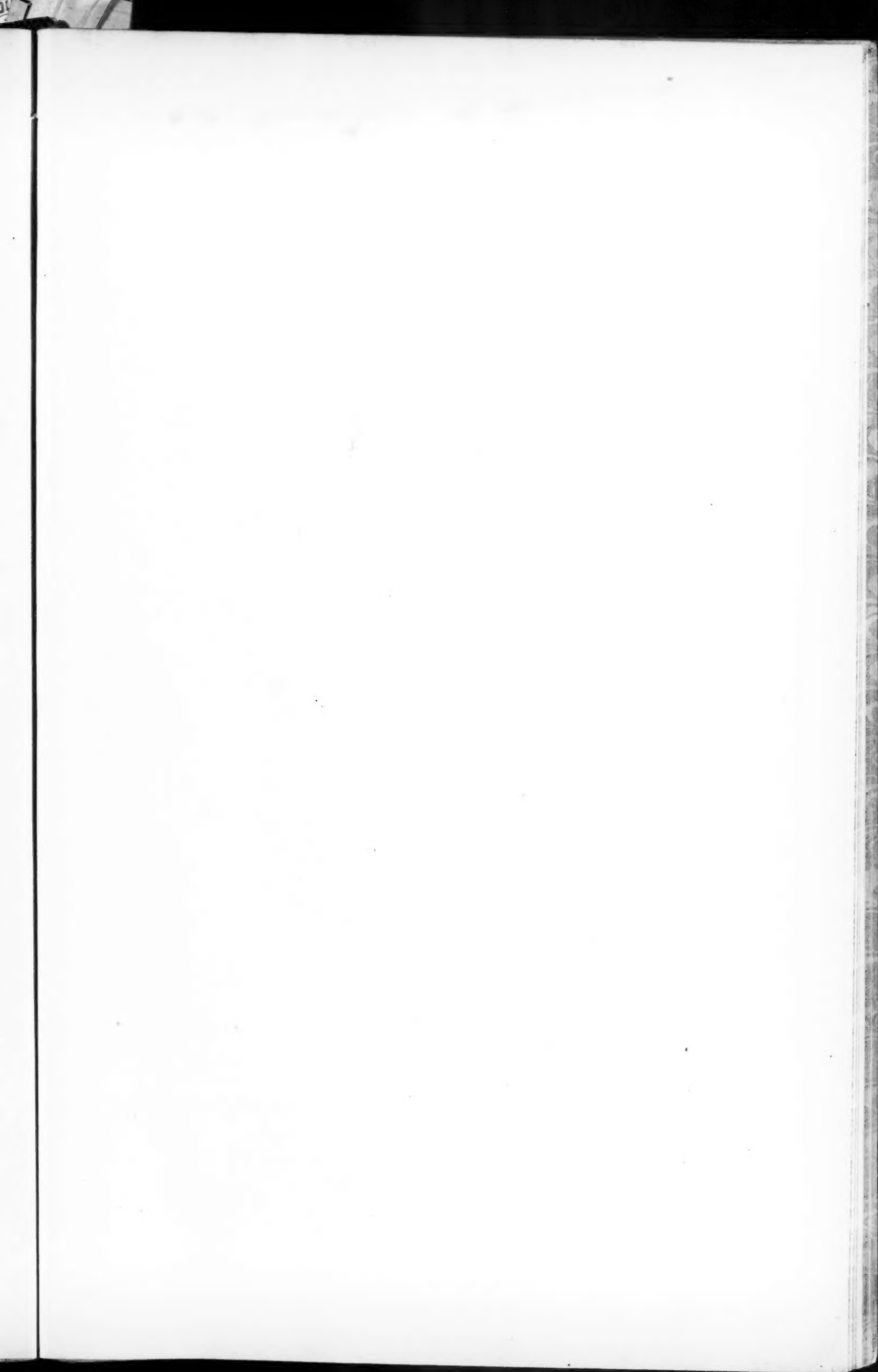
To convert Minette pig into steel in the Ruhr district, the distant mill has the advantage of a freight rate of 8.50 to 9 marks per ton on pig iron, or, using 1.15 tons at 8.75 marks, say 10 marks per ton, against 11.50 marks coke freight for smelting the ore in the Minette district. But as more than an offset for this, the distant steel plant converting Minette pig loses the advantage of the direct process of Bessemerizing, which it is reputed amounts to at least 3 marks per ton.

Of course, the makers on the Rhine, who get their ore from foreign sources chiefly and haul the coke a short distance, may at times, when the international ore market favors them, get down their costs very low, their ores being richer, their coke consumption lower, say 0.90 to 0.95 per ton, and they can reach the shipping ports at 2 or 3 marks, against 5.50 to 6 marks for the Minette district, but even then it is difficult to go against an ore, lean though it be, which costs 1.25 to 2 cents a unit.

#### The Minette Deposit.

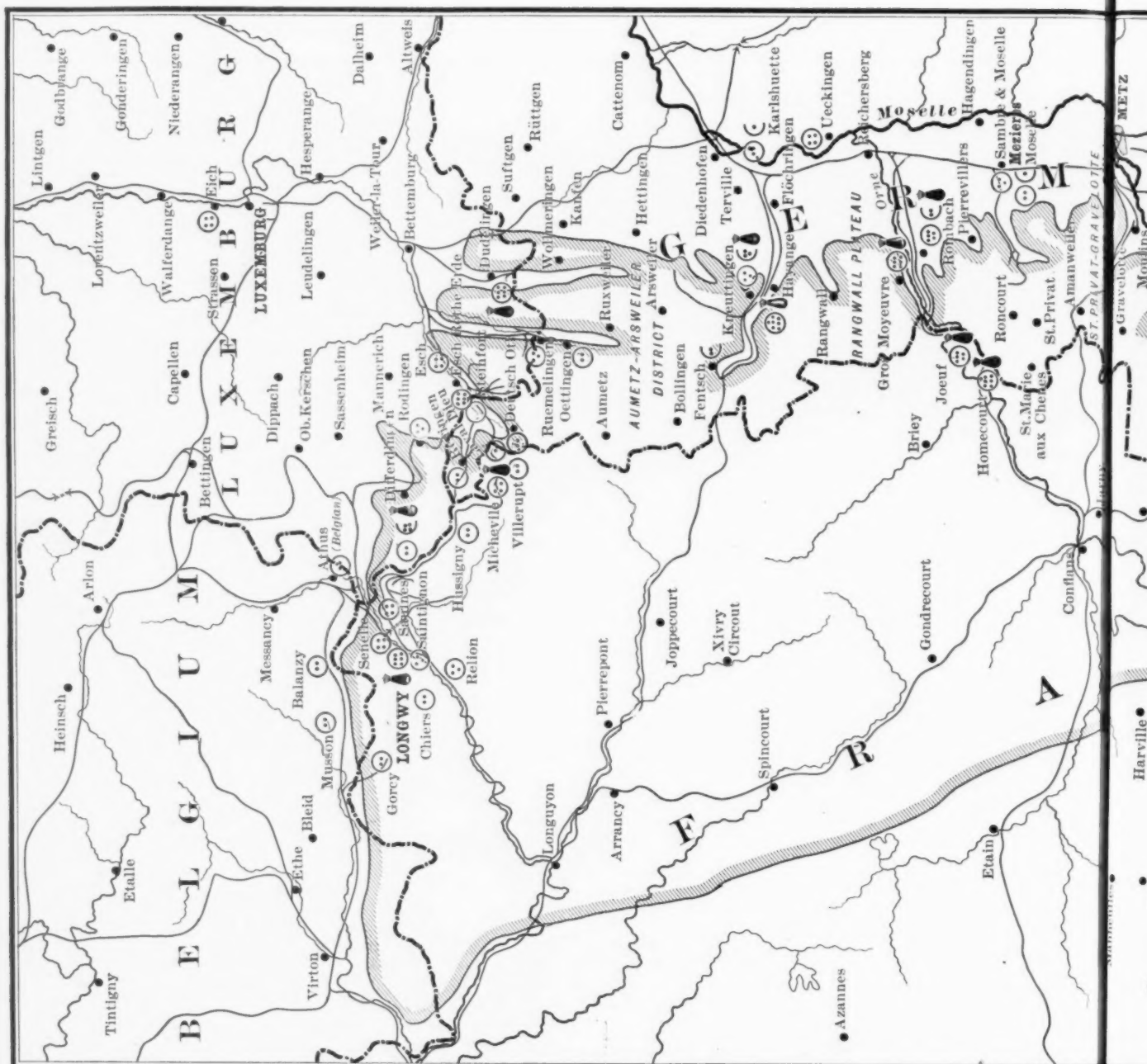
It is only in recent years that an exhaustive study has been made of the Minette deposit, and it is due chiefly to the energetic efforts of E. Schroeder of Dusseldorf, the secretary of the Verein Deutscher Eisenhuettenleute, that the literature has been enriched by a series of monographs. The first impulse was given by him in a brilliant paper on the "Sources of the Ore Supply for the Blast Furnaces in Germany," published in *Stahl und Eisen*, the journal of the society, on February 23, 1896. Since then a series of monographs have been published by Dr. W. Kohlman, by L. Hoffmann, by Fr. Greven and W. Albrecht, treating of different sections of the formation in Lorraine, and the last named incidentally of Luxemburg. All these have appeared in the columns of *Stahl und Eisen*. There seems to be very little recent French literature, and it has proved a somewhat difficult matter to complete the data so as to embrace the latter. For Lorraine, the geological survey of Elsass-Lothringen at Strassburg has published an admirable map, and the monographs referred to have a number of excellent ones which, however, are rather too much detailed to serve the more general purpose of the readers of *The Iron Age*. Your correspondent has therefore attempted to complete the sketch map accompanying a paper contributed by Dr. H. Wedding to the Transactions of the Verein zur Beforderung des Gewerbefleisses at Berlin.

The word Minette was originally applied to the ore contemptuously as indicating worthlessness by French miners, who sought and worked the wash ores of an upper horizon, which they called "mine." The latter, once important, are now rarely given any attention. The Minette is an oolitic brown hematite, or small grains of hydrous iron oxide, agglomerated by calcareous, siliceous or marly matter. The grains are small and consist of concentric shells of iron oxide and a siliceous skeleton, a structure which affords little hope that concentration will ever become possible to unite the ores and thus render them capable of transportation over longer distances. The ore beds occur in what the Germans call the Dogger formation, lying on strata belonging to the Lias. In the accompanying map the extent of



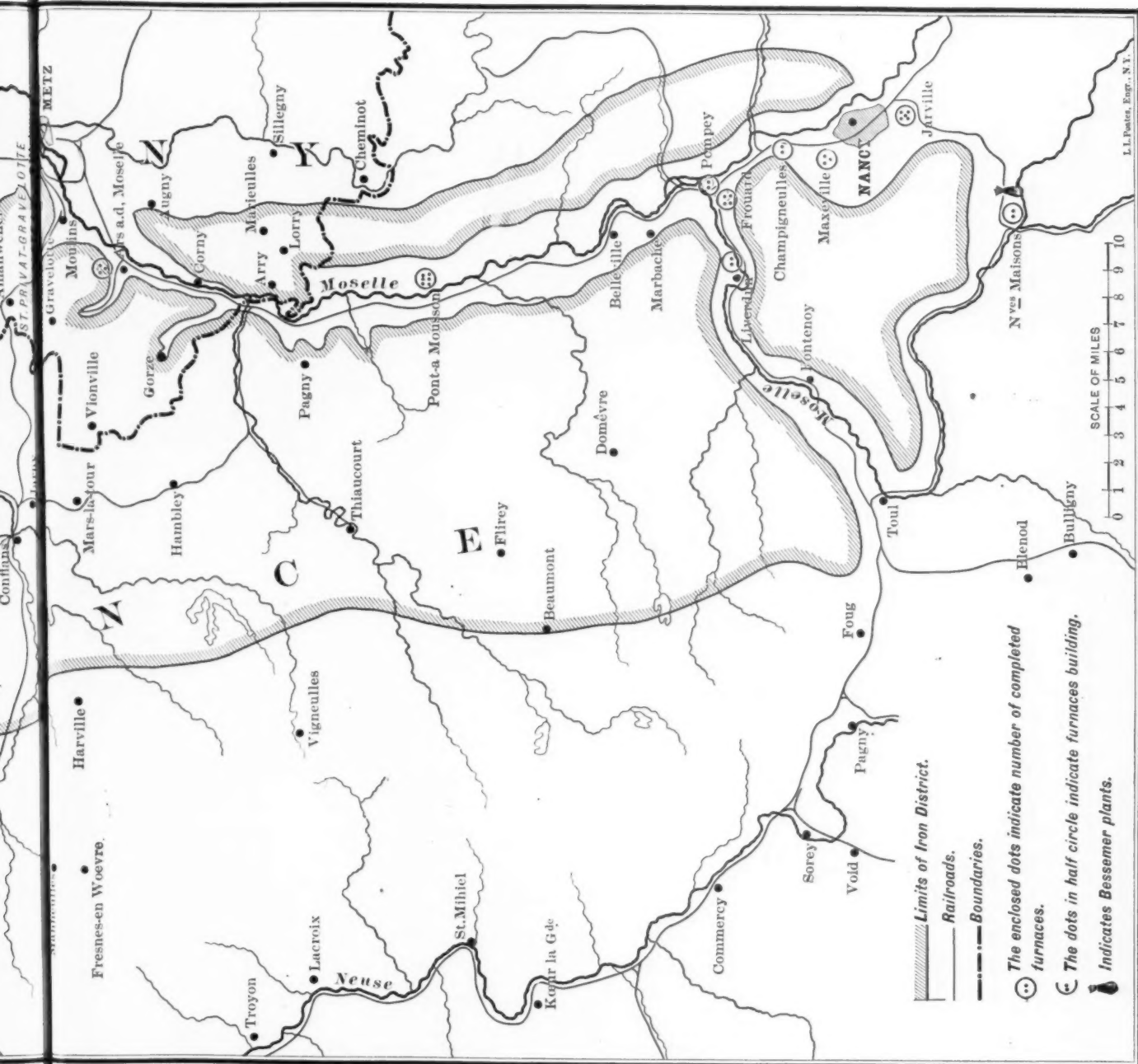


SUPPLEMENT TO THE IRON AGE, JUNE 28, 1900.



MAP TRACT.

## THE MINETTE DISTRICT OF LONE







the Dogger formation is indicated as largely coincident with the extent of the ore field.

This formation crops out along the left bank of the Moselle River, in Lorraine, forming the escarpment of hills which rise from the plain. In France it is cut by the river, a narrow strip being left on the eastern bank, the formation extending to a point south of Nancy. Its northern rim passes through the southern part of Luxemburg and touches Belgium. Since the dip of the formation in a general way is toward the southwest, ranging from 1 to 2 degrees, the cover becomes greater and greater. In a general way, too, the beds gradually disappear and show a tendency to become siliceous in the same southwestern direction. Since the Northern rim is cut into, in the Longwy district in France, and in the Luxemburg and adjacent Lorraine section, by a series of valleys, that part of the deposits was first attacked. In many cases the stripping is light and the whole series of beds may be mined by open cut. A good idea of one of the large workings of this type is furnished by the accompanying half-tone of a photograph of the mine near Hussigny, France, of the Société Lorraine Industrielle, operating on Luxemburg soil. It may be noted that at this point there are four beds, with an aggregate thickness of 14 m. of ore, and 14½ m. of stripping and intercalated strata.

Access to the ores at the outcrop, greatly increasing the possible areas of attack, particularly along the northern part, has been facilitated by the small brooks. Between the Chiers and the Alzette lies the basin of Belvaux-Lamadelaine. Next is the Esch-Ruemelingen basin. South of that is the Aumetz-Arsweller district, bounded on the south by the Fentsch River, a tributary of the Moselle, the Alzette being a tributary of the Sauer. One of the brooks emptying into the Fentsch leads to Algringen, north of Kneutlingen, and is the scene of very active mining operations. The Orne Valley, next to the south, has a series of mines, while further south we have the Bronvaux Valley west of Malzières, the Monvaux Valley, the Manze Valley starting from Ars, and the Noveaut-Gorze Valley.

Practically open cut mining operations are confined to the northern rim in the Belvaux-Lamadelaine and Esch-Ruemelingen basins, while south the attacks in the Fentsch and Orne valleys are made through tunnels, often of very considerable length. Thus the firm of Les Petits Fils de François de Wendel have an underground connection between their mines at Gros Moyeuve and Hayange.

In recent years, however, the concessions on the plateaus of Aumetz, Rangwall and south of the Orne have been opened by deep shafts, both in Lorraine and in France, the principal undertakings being those of Aumetz-Friede, Rombach at Montois, Vezin-Aulnoye at Homécourt, Moselle at St. Marie au Chenes, and Pont-à-Mousson at Auboué. In fact, in 1896 Schroedter made the statement that the calcareous bed of Luxemburg, which is the best Minette, will be exhausted in 10 to 15 years. The Minette formation, which generally speaking is regular, is subject to considerable faulting, the throw being in some cases from 130 to 200 feet. There are two series of such faults. The more important are indicated by dotted lines in the map, coursing northeast-southwest, while a second minor series is usually at right angles to the former. Some of these faults have been traced for long distances, that of Metz Gorze for over 50 miles.

The thickness of the formation varies within wide limits. In the northern fields it goes up to 180 feet, while it drops to nearly a tenth of that to the southward. Similarly the range of thickness of the beds and their number is very great. In the northern districts as many as nine beds are recognized in isolated cases, but at its best the formation holds five beds, known in their order from the hanging to the footwall as the "red siliceous," the "red calcareous," "yellow," "gray," and "black" beds. While sometimes the colors are characteristic, they are oftener not so. Therefore the identification of particular beds as such in different districts is often a matter of serious doubt, particularly since one or more are generally missing altogether. Then the line of demarcation between an individual bed and the country rock is not always very distinct, so that figures bearing on the thickness are not absolutely reliable. In the monographs referred to there are a very large number of sections, as proven by mining operations or indicated by borings, which show an extraordinary variety. Nor does any particular bed maintain either its thickness or show constancy as to its contents. Generally speaking, the beds diminish in number and in thickness toward the southwest, only a single one being known along some parts of the southern fringe. It appears, too, that there is a tendency toward a greater silica contents in the southwestern direction.

It would be useless to multiply sections, but the leading fact may be noted that while at one time Luxemburg, the adjoining French and German districts appeared to have the cream both as to cheapness of min-

ing, number and thickness of beds, and richness and character of ores, the plateau, notably of Aumetz, and more recently that of St. Privat-Gravelotte, in Germany and France, have excellent deposits. The French possess an additional field of importance in the vicinity of Nancy. Of course, the availability of a bed for profitable extraction is a function of local cost of mining, as determined by surroundings, by its thickness and by the richness and character of the ore. The calcareous ores are scarcer and therefore more sought after, because the aim is to make a furnace mixture which shall be self fluxing by adding the proper percentage of siliceous ores. That mixture, in the different furnaces of the region, varies from 29 to 33 per cent. of iron, and that is as much as can be expected from the native ores, involving as it does some culling of limestone nodules from the calcareous red Minette bed. The ores are low in sulphur, and the mixture produces an iron containing enough phosphorus to make a pig suitable for the basic Bessemer process, although much too high for the ordinary foundry operations. This is the reason why it never entered into mixtures beyond a limited extent, except for cast iron pipe. In some localities your correspondent, however, observed that cinder was being used, apparently to get more phosphorus. The general practice, in order to secure enough manganese in the iron, is to charge small quantities of Bilbao manganese ores, the siliceous grades being usually selected because, being shunned by other consumers, they are relatively cheap.

Some of the German authorities have made elaborate calculations as to the available reserves of ore. Suffice it to say that these place the life of the district far beyond a term in which the next few generations are likely to be interested.

#### The Production of Ore.

The magnitude of the mining industry and its rapid growth is best illustrated in the following table, showing the production of Lorraine, Luxemburg and France, the latter being that of the department of Meurthe et Moselle:

Production of the Minette District, Metric Tons.

| Year.      | Lorraine. | Luxemburg. | France.   | Total.     |
|------------|-----------|------------|-----------|------------|
| 1872.....  | 685,000   | 1,171,000  | 1,009,000 | 2,865,000  |
| 1885*..... | .....     | 2,648,449  | 1,611,558 | .....      |
| 1890*..... | .....     | 3,359,413  | 2,630,311 | .....      |
| 1891*..... | .....     | 3,302,478  | 2,735,021 | .....      |
| 1892*..... | .....     | 3,370,352  | 2,928,478 | .....      |
| 1893*..... | .....     | 3,351,938  | 2,809,269 | .....      |
| 1894.....  | 3,922,052 | 3,958,280  | 3,062,373 | 10,942,705 |
| 1895.....  | 4,322,352 | 3,913,076  | 3,064,037 | 11,219,465 |
| 1896*..... | .....     | 4,758,741  | 3,440,761 | .....      |
| 1897*..... | .....     | 5,349,000  | 3,804,078 | .....      |
| 1898.....  | 5,955,776 | 5,349,951  | 3,883,718 | 15,188,445 |
| 1899*..... | 6,972,758 | 5,995,408  | .....     | 17,000,000 |

\* Complete figures for these years have not been obtained.

It will be observed that the total has probably reached 17,000,000 tons in 1899, that Lorraine has shown the greatest development, Luxemburg following closely, while France is progressing at a slower rate. At 31 per cent. average contents this ore quantity represents a total pig iron product of 5,250,000 tons, certainly an enormous total.

In France in 1898 the Longwy basin produced 2,109,000 tons of the total, the principal individual mines being Hussigny with 567,000 tons, Saulnes with 308,000 tons, Moulaine with 239,000 tons, Micheville with 294,000 tons, Godbrange 242,000, Tiercelet 150,000, and Longlaville with 108,000 tons. The Nancy district is credited with 1,673,000 tons, to which the principal individual contributors were Chavigny 346,000 tons, Val de Fer 234,000 tons, Lindres 175,000 tons, Marbach 134,000 tons, Buxières aux Dames 111,000 tons, Boudonville 98,000 tons and Fontaine des Roches 95,000 tons.

#### Mining Property and Mining Cost.

In Luxemburg the system of granting concessions is somewhat peculiar. So long as there is only 8m. of cover, the ore belongs to the owner of the soil. At one time, in order to encourage the building of railroads, concessions were freely given to them. Conspicuous among them is the Prince Henri IV Railroad, whose line winds about along the outcrop, having been built so as to secure a maximum of concessions. Two other railroads have been similarly subsidized, one of them being the Chemin de Fer Communales, and the other the Guillaume-Luxembourg. In recent years the Government of the grand duchy has been far more cautious in parting with mineral property. To begin with, it has been practically determined that no one need apply who does not smelt the ore within the borders of the State. Then a royalty is charged, and lately some other ideas have been advanced. Thus it is proposed to make one of the conditions governing the grant of a tract of Minette that the steel works making application therefor shall give the basic Bessemer slag to the State, the idea being that the agricultural community shall have the advantage of the phosphorus taken from the ground in mining. However, some of the older concessions, held

by private persons, come into the market from time to time and have found eager takers, the price being steadily advanced until lately 20,000 francs per hectare has been paid—a figure which would have been thought highly extravagant not long since. In Luxemburg there is still a good deal of mining done by parties having no connection with metallurgical interests. This ore comes into the open market and is largely handled by large merchants, the firm of Carl Spaeter of Coblenz doing the most extensive business. Even farmers' banks, once numerous, still exist. A good deal of the stripping and of the open cut mining is done by contractors, who are paid about 75 centimes per cubic meter and get 75 to 90 centimes per ton for the ore delivered on cars. This figures the total cost of mining, stripping included, in favorable locations, at about 25 cents per ton, of course rising above that figure with heavier cover, thinner seams, &c. In some cases, of course, royalty must be paid to the owners of the concession. Under the pressure of a heavy demand for ore prices during the past year are counted relatively high, and to-day the ore fetches from 2.30 marks per ton up to 3 marks per ton for particularly desirable rich and calcareous ores, say 57 to 75 cents per gross ton. So far as your correspondent could discover the ores sold in the open market are not subject to any close guarantees, as to the iron contents, nor as to any definite proportion of lump and fine. The buyer simply takes the run of mine and must depend largely upon the good faith of the miner to cull out closely the streaks of limestone in the ore beds. However, this system of handling the ore is destined to disappear more and more in the Luxemburg and adjoining Longwy district in France, with the exhaustion of the outcrop open cut mines not controlled by iron concerns.

In Lorraine there is very little of independent ore mining, nearly all the properties being in the hands of iron producing companies. During the past few years the number of concerns in distant districts in Germany and Belgium who have acquired mining property in the Lorraine district has grown very considerably. Among those in the Rhenish province and in Westphalia are the following: Aachener Huetten Act. Verein, Gutehoffnungshuette, Friedrich Wilhelms Huette, Phoenix, Union, Hoerde, Hoesch, and Krupp. The companies of the Saar district have increased their holdings, the most conspicuous being Gebrueder Stumm of Neunkirchen, the Roeblings of Saarbruecken, Burbach, and the Dillingen Company. The Angleur Company of Belgium also control mining property, as do all the local Lorraine works. The Cockerill Company of Seraing own mines in Luxemburg.

It is stated that at one time the cost of ore mined from tunnels went as low as 20 cents, delivered by wire tramway to the blast furnace. With deep mining the cost, generally speaking, has risen. Still, in the case of one large property equipped to produce on a large scale, the claim is made that the cost of mining the ore, delivered on cars at the shaft, will be as low as 20 cents a ton. Of course, nearly every individual property is affected by its own set of conditions, and there are differences as to the principles pursued in providing sinking funds for exhaustion of the mineral property and writing off for plant and equipment. Your correspondent, however, was advised that 50 cents per ton is a fair average for deep mining with modern methods and good management. To this must be added a moderate sum for the haul from the mines to the furnace plant, which would carry the self fluxing mixture up to a little over 2 cents per unit. With a consumption of coke of between 1.2 and 1.3 tons per ton of iron, costing delivered \$6.12 per ton, and with the labor cost at 60 to 75 cents per ton, the cost of making the iron may be approximately reached. The price of the coke syndicate is now 17 marks per metric ton, and the freight 8 marks on an average, so that that is by far the greatest item in the cost. At one time, when coke was low in Westphalia, the Lorraine and Luxemburg furnaces succeeded in making iron as low as 30 marks per metric ton, or say \$7.50 per ton, which would be the measure of the capacity of those controlling their own Minette ore and their own collieries and coke plants, with labor back to its level of former years. Since, however, the latter can only be reached after a costly struggle, and since the prices paid for mineral property in recent years are high, it is not likely that even companies thoroughly rounded and protected in every direction will reach as low a cost for a long time to come. Under present conditions the range of pig iron cost is placed by some of the leading men at 46 to 50 marks per ton, or say, roughly, \$11.50 to \$12.50 per gross ton. Placing the cost of conversion at \$3.25 per ton, slag value deducted, and adding \$1.50 for freight to tidewater, it appears that the new works in Lorraine and Luxemburg could get to Antwerp for, roughly, \$16.25 to \$17 per ton of billets, at present costs, and at considerably less in normal times.

In France, concessions for mineral property have always been restricted pretty closely to the actual con-

sumers of the ore, so that the outsiders are very few in number. What ore comes into the open market is the surplus mined by some companies. Recently a new law has been proposed under which a royalty is to be paid to the State.

#### Prices of Ore and Pig Iron in Luxemburg.

Auguste Dutreux of Paris has compiled some figures for a series of years, which show the fluctuations in the prices of Minette ore in Luxemburg and of Luxemburg pig, both in francs per metric ton. An interesting series of figures which we also quote below is the annual production per man of ore, in metric tons:

| Years.    | Average price of ore. Francs per metric ton. | Average price of pig. Per metric ton. | Average annual product, per man. Tons. |
|-----------|----------------------------------------------|---------------------------------------|----------------------------------------|
| 1880..... | 3.05                                         | ..                                    | 598                                    |
| 1885..... | 2.53                                         | ..                                    | 663                                    |
| 1890..... | 2.45                                         | 68                                    | 804                                    |
| 1891..... | 2.42                                         | 53                                    | 776                                    |
| 1892..... | 2.32                                         | 46                                    | 842                                    |
| 1893..... | 2.33                                         | 43                                    | 838                                    |
| 1894..... | 2.30                                         | 45                                    | 832                                    |
| 1895..... | 2.45                                         | 46                                    | 945                                    |
| 1896..... | 2.48                                         | 51                                    | 945                                    |
| 1897..... | 2.62                                         | 58                                    | 945                                    |
| 1898..... | 2.60                                         | 55                                    | 982                                    |
| 1899..... | 2.84                                         | 57                                    | 985                                    |

The lowest price for pig iron made was reached in 1889, with an average of 36 francs, or less than \$7.25, per ton. Then there was a sudden jump, followed by years of decline and then by the years of steady maintenance of prices. The increase in the efficiency of the mining, as reflected by the rapid growth in the product per man per annum, is striking.

C. K.

#### The American Rolling Mill Company.

The company organized early in the year, known as the American Rolling Mill Company of Cincinnati and Middletown, Ohio, have secured control of the American Steel Roofing Company, and both concerns will, after the completion of the rolling mill plant at Middletown, be operated under one management, of which George M. Verity will be president, W. T. Simpson, vice-president and R. C. Phillips, secretary.

Mr. Verity has for the past ten years been the active head of the American Steel Roofing Company, in which he has been eminently successful. Mr. Phillips has also been identified with the same enterprise, contributing no little to its success. Mr. Simpson was for upward of 20 years proprietor of the American Galvanizing Works of Cincinnati, but sold out to the American Tin Plate Company. In addition to these the directory will be made up of Major Harlan P. Lloyd, Jacob Meurer of Meurer Bros., Brooklyn, N. Y., and James B. Strawbridge, late of the Norton Tin Plate Works of Chicago, Ill. Mr. Strawbridge will assume the practical management of the mills, located at Middletown, where the company are now busily engaged in the erection of their plant. Ten acres of ground have been secured with ample railroad connection.

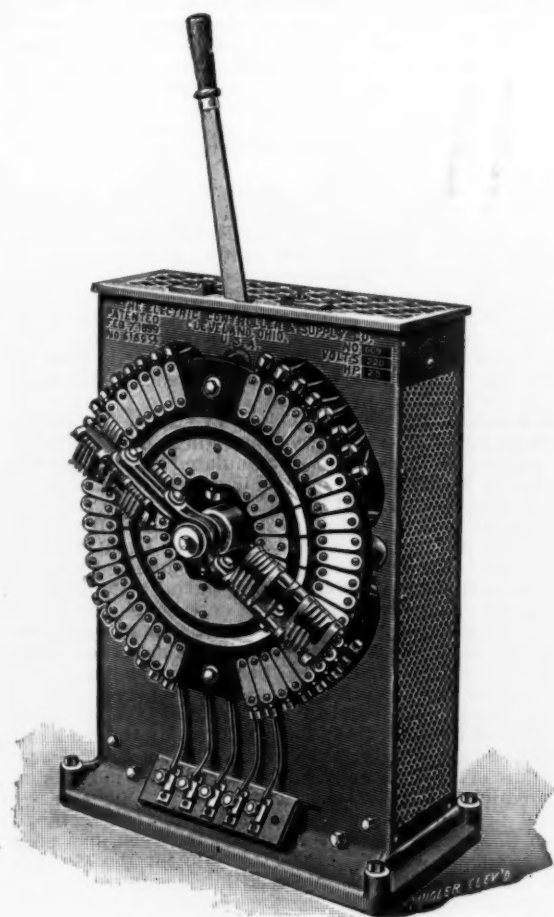
The foundations are now in and the superstructure is rapidly going up. It was originally intended to produce only black and galvanized sheets for roofing, &c., but it has now been decided to include basic open hearth steel sheet bars and billets, in addition to sheet steel building material. The capital stock of the company, originally \$350,000, has been increased to \$500,000. Of this amount \$400,000 is common stock and \$100,000 preferred guaranteed 7 per cent. accumulative. The actual paid in capital stock at present is \$350,000. The new concern, while not antagonistic to other interests of a similar kind, will nevertheless operate entirely independent of any consolidations.

A dispatch from Cleveland, under date of June 23, states that at a meeting held last Tuesday evening the union molders decided to ignore the decision arrived at in Detroit on the 15th inst., and have asked their international organization for permission to strike. Many of the men were in favor of striking when the temporary settlement was made in Indianapolis, increasing their pay from \$2.75 to \$2.85. At the Detroit conference the manufacturers rescinded the temporary advance of 10 cents, and the men are now determined to go out. The union molders in Cleveland number nearly 1000, and they are said to be well prepared financially to carry on a strike. The manufacturers say they are coming to an end of their contracts, and with little new work in prospect and with buyers insisting on lower prices, an advance at the present time is out of the question, and there is a possibility of some of the foundries being closed down for lack of business.



### The Dinkey Ventilated Controller.

The accompanying cuts illustrate the Dinkey ventilated controller, manufactured by the Electric Controller & Supply Company, Cleveland, Ohio. A feature claimed for this controller is that of free and uniform ventilation. The resistance ribbon is practically strung in air; hence a large amount of current can be carried without injury. In fact, the manufacturers state that the resistance ribbon can be run red hot. Another point is the ease of installation. All the resistance panels are contained in the machine. There are no separate boxes to go under the floor or elsewhere, each of which would require separate connections. This means a saving of time in installing the controller, as there are only four terminals to connect the controller in circuit with the motor. If a ring for brake contact is furnished, as



Front View.



Rear View.

### THE DINKEY VENTILATED CONTROLLER

shown in the cut, an additional terminal is required. In case of accident to the electrical equipment, the controller can be removed and replaced quickly and without loss of time.

A single lever controls both the forward and backward motion of the lever, no reversing switch being required. The contact points can quickly be removed and replaced from the front of the machine, and without disturbing lead to the resistance. Only a shunt current is carried through the screws that hold the contact points in place. The contact fingers never drop off from the contact face, and do not have to be replaced until entirely worn out. The controller contains no combustible material, and is therefore fire proof. It is especially well suited for crane service. The manufacturers claim that it will stand up longer and cost less for repairs than any other controller on the market. Further details will be gladly furnished by the manufacturers upon application.

The directors of the New York Air Brake Company met on Thursday last in New York City and elected C. A. Starbuck president; Thomas C. Purdy, Daniel Magone and Geo. B. Massey vice-presidents, John C. Thompson secretary and treasurer and C. H. Chaffee assistant treasurer.

### The Delaware Forge.

The Delaware Forge & Steel Company, recently incorporated with a capitalization of \$5,000,000, have the largest capital of any *bona fide* company doing business in the State of Delaware under the new incorporation laws. The incorporators are J. C. Osgood of New York, John Fritz of Bethlehem, Pa., well known through his former connection with the Bethlehem Steel Company; H. S. Swyth of Bethlehem, a well-known capitalist; John Stambaugh, Jr., an iron manufacturer and capitalist of Pittsburgh; Seward Babbitt of Pittsburgh, who is connected with the Tod Engine Company of Youngstown, Ohio; Walter M. Gorman of Philadelphia, a director of the Diamond State Steel Company; Howard T. Wallace of Wilmington, Del., president of the Diamond State Steel Company; William Lawton, president

of the Wilmington Board of Trade, and J. Ernest Smith, an attorney.

The officers of the new concern are as follows: President, John Fritz; vice-president, Seward Babbitt; secretary and treasurer, Howard T. Wallace.

It is understood that a considerable number of large capitalists of New York and the Middle West will be interested in the company. They will make heavy forgings, and under the powers of their charter may largely extend the branches of their business in any line consistent therewith, and it is expected that several thousand men will be employed by them when in full operation.

The company will shortly begin the erection of buildings on their 200-acre tract at Wilmington. The forge alone will occupy 400 x 1600 feet, and will necessitate the expenditure of \$500,000. Besides this there will be a large machine shop of about the same size as the forge building. One line of business in particular which the company will prepare to handle will be the making of shafts for vessels.

The Republic Iron & Steel Company, the Birmingham Machine & Foundry Company and other interests in Northern Alabama have jointly appointed a resident ex-

port agent, with headquarters at London, England, to directly represent them on the Continent and secure orders for pig iron, rolling mill and steel mill products, coke and coal and machinery. It is believed that there is as good a market in Europe for the finished products of steel and iron and machinery made in the Birmingham district as for its raw pig iron, and an effort is to be made to establish a permanent trade in these lines. J. L. Knoepfer of Birmingham, Ala., has been appointed export agent.

### Lake Ore Matters.

DULUTH, MINN., June 24, 1900.—The Great Northern Railway has begun the construction of its new line from Duluth to the Mesaba range, and men are scattered along for 40 miles. Camps for engineers and graders are going up at short intervals, and grading has already begun at many points. Much of the work will be through "muskeg" swamps, and the construction of good roadbed will be the work of years. The Duluth, Missabe & Northern has been at it seven years in its "muskegs," and is not through yet. The new road parallels the Missabe line 35 miles, and for long distances the two are within 200 feet of each other. With the Missabe double tracked, and with another road a few hundred feet away, the volume of ore traffic coming off the Mesaba will begin to be appreciated. The double tracking of the Missabe line will be completed within two years. Your correspondent rode over the line a day or two ago, and in the two hours occupied in passing between Duluth and Iron Junction no less than seven loaded ore trains were met, each of 50 cars, about 1500 tons. The present traffic of the Duluth & Iron Range is even greater, and trains come down each 24 hours at the rate of about 4,500,000 tons for the season. This, however, is about the rate of traffic of last year at this date, considerably less than what was expected this season. The falling off is due to the change in the market conditions and the Rockefeller "strike" for 25 cents more on all wild tonnage, which is affecting the movement now quite appreciably.

A statement has been made by Manager L. M. Bowers of the Rockefeller shipping interests, in reference to the tying up of that tonnage, in which he says that no contracts will be made at less than the prevailing season rate, \$1.25 a ton. This, says Mr. Bowers, is due not alone to the shipping interests he represents, but to mines and furnaces that had taken the bulk of their tonnage at \$1.25, and should not now be compelled to meet competition on the basis of lower freights. In other words, Mr. Rockefeller stands in the position of guaranteeing the rate, and if Mr. Bowers' words mean anything they mean an assured steadiness in the future that lake freights have never had. It has been the wildest kind of fluctuations that the Cleveland vessel market has been subject to in the past, the owners' own price for ships when room was scarce and the shippers' own when ships were plentier than cargoes. Any steady influence will be valuable, and that of the Rockefeller fleet can be made very great.

On the Mesaba range explorations continue as heavily as though the cost had not almost doubled in a very short time. A \$10 jump in the price of carbons, per carat, makes them worth \$65 a carat now, and exploring companies are charging \$7 per foot for drilling through hard rock or \$3.50 for drilling in ore. A drill has just been started in the center of the burned portion of the village of Virginia, while another began this week a mile north of the town. Others are at work a mile northeast, on the Fay property, which is now the possession of Samuel Mather and associates, who have the leasehold interests at \$110,000 cash. A working shaft is also being sunk there. The Cleveland Iron Company, who have been drilling just south of Virginia, have stopped work, and drilling on the town site for the Wyoming Company has also stopped. Ore was found in quantity, by the latter work at least. Near the west end of the range new explorations have begun for the McGregor Iron Company in the southwest part of 58-20. There are some concerns working still further west just now.

Since the close of the South African war many drillmen and expert miners have started for Johannesburg and other points there. Half a dozen expert drill runners and setters have gone to the Guinea gold coast, West Africa, under contracts with the Sullivan Drill Company, to explore a new gold region, said to have the possibilities of the Witwatersrand. These men are to remain some time. A full machine outfit was sent with them, and all are now on the water. There has been a call, too, for drillmen for the Isthmian Commission, to test the geological conditions for the proposed canals.

While excavating for the grade for the new Milwaukee line near Crystal Falls, ore was uncovered close to

the Hilltop Mine, and explorations are now under way. The indications are for a large deposit. The first ore to be moved by the new railway was dumped at the Hilltop last week, and a change of importance was inaugurated for that portion of the Menominee range. Hilltop has been opened till it is quite a property, and can be mined at small cost. A 10-drill compressor has been installed. The Menominee Exploration Company are to abandon Sheridan Mine, though some considerable ore has been shipped during the option. At the mines of the Penn Iron Mining Company 400 men are employed, working the West Vulcan, Norway and Curry mines. At the East Vulcan the company have completed the work of unwatering and commenced mining. A 30-drill compressor will be added to the equipment, and the mine will be a large producer again. It has been idle many years. It will add 50 men to the employees of the company. The Penn Company are to ship this year about 250,000 tons. At the Chicagoan Mine, under option to the Oliver Company, very satisfactory progress is made. Hiawatha Mine, from which a trifle of ore was shipped last year, ships now quite considerable, 1800 tons last week. Its ore is good. Wages have been cut somewhat on the Menominee range, especially on explorations, where they are 15 to 20 per cent. less than before. It is useless to deny that explorations have not been as fortunate as had been expected.

The new Hartford Mine, Marquette range, is down 200 feet in the shaft, but it will be impossible to reach the ore deposit this year. At old Hartford they are doing nothing, the ore being low grade. Webster Mine of the Cleveland Cliffs Company is about ready for resumption on a good scale, and will be pushed. Its ore is a yellow hematite. At Michigamme the new railway to Escanaba is almost ready to handle ore. At Negaunee Mine about 150 men are employed again. It is hoisting a little ore, but cannot do much this year, at the best. It may be in shape in 1901.

Red Jacket, the mile-deep shaft of Calumet & Hecla, has been unwatered this week by ballers of the 10,000,000 gallons of water that accumulated therein during the fire in No. 2 Hecla. The mine is now sending up rock as fast as ever, and its mills are making a full production. It was so full of gas from the burning wood of No. 2 shaft that it was necessary to start air artificially, and this was accomplished by running the skips in connected shafts as pistons, the shafts themselves being the air chambers. There is an enormous quantity of timber in this mine, its annual requirements being from 10,000,000 to 15,000,000 feet, and the imagination pales at the thought of what a fire there might become. All the Calumet and Hecla shafts are now reopened.

The small mill built on the Franklin Copper Mine stamp sand dump to treat these tailings by the Emmons process is apparently a success. The successful reclamation of these stamp sands would add millions to the product of the copper country.

The first of the new lake steamship contracts, to which this correspondence referred last week, has been announced. It is to be a 6000-ton ship for the Mitchell fleet. Others will be announced later. It is reported that the plates for this ship were bought for less than \$26, Pittsburgh.

D. E. W.

### Pennsylvania Engineering Graduates.

The University of Pennsylvania, at Philadelphia, has issued a "Directory of Graduates in Engineering," which will be furnished any one on application to that institution. The university was founded in 1740. Its development within the past decade may be judged partly from the following: In 1890 it had 1579 students and 180 instructors. It has now an enrollment of 2673 students and a staff of 260 instructors. Of its 34 buildings 20 were added during the past ten years.

The courses in civil and mechanical engineering were established in 1872; those in electrical and chemical engineering in 1891 and 1892 respectively. There are at present 306 students in the Towne Scientific School, of whom 172 are pursuing courses in engineering. The graduates number 469, of whom 445 are living. Of these, about 71 per cent. are engaged in engineering practice, 12 per cent. in lines related to engineering, 13 per cent. in other professions and pursuits, and the addresses of the remaining 4 per cent. are unknown.

The Hawaiian Electric Company, through their general manager, A. Gartley, who has just returned to Honolulu after making an extensive trip through the United States purchasing machinery for their plant, have placed a contract with the York Mfg. Company, York Pa., for one of their latest improved 75-ton cross compound condensing refrigerating machines and a 10-ton ice making plant.



### The American Steel Hoop Company.

The American Steel Hoop Company on Monday last removed their main offices from Pittsburgh to New York. The heads of the executive department had been in New York, but the vice-presidents in charge of the accounting departments were in Pittsburgh. It is the intention of the directors to move all the branches except the operating department, and in New York have them located in the same building as the American Tin Plate Company, the American Sheet Steel Company and the National Steel Company.

A special train left Pittsburgh on Sunday night for New York over the Pennsylvania Railroad. Accommodations for 60 were provided, and all the office paraphernalia was taken along.

It is announced that this removal has been the aim of the large stockholders and directors ever since the company were formed. There is now in the Battery Park Building a complete chain of executive depart-

dated Railroad in Connecticut, and as the result the officials of the road declare the car can maintain a speed of 65 miles an hour. The car is the first of a number which are to be used between Providence and Fall River. The distance is 17 miles.

### Mining Concessions in Guatemala.

United States Consul-General McNally, at Guatemala City, has sent to the State Department at Washington the following translation of a decree relating to mining concessions in the Republic recently issued by the Guatemalan Government:

All mining enterprises established or to be established within two years shall have from this date and for the next 15 years the following concessions:

1. All the machinery and utensils which are not manufactured in the country and are necessary for the discovery or operation of mines shall be exempt from fiscal



THE BARNES UPRIGHT DRILL.

ments of the Moore steel companies. These include the American Steel Hoop Company, the National Steel Company, the American Tin Plate Company and the American Sheet Steel Company.

### The Barnes Upright Drill.

The 20-inch upright drill made by the B. F. Barnes Company of Rockford, Ill., has unusually strong driving power for a tool of its size, being capable of drilling up to 1 inch in steel and  $1\frac{1}{4}$  inches in cast iron. It is made with both round and square base, and is provided with either lever feed only, combination worm and lever feed, or power feed with automatic stop. In each case it has the movement for quick return of the spindle common to drills of this class. The drill is 68 inches high, and the diameters of the column, table and spindle are  $5\frac{1}{2}$ , 16 and 15-16 inches, respectively. The vertical travel of the table is 16 inches, and that of the spindle 10. The greatest distance from the spindle to the round base is 43 inches and to the square base 41 inches. The greatest distance from the spindle to the table is  $26\frac{1}{2}$  inches.

A high power electric motor car was tested a few days ago over the New Canaan branch of the Consoli-

and municipal duties. The invoices will be examined by the secretary of fomento.

2. Mining properties will only be subject to the taxes or duties called "territorial contribution," which is 6 per 1000. The exportation of all mineral products is free from any duty, fiscal or municipal.

3. The freight rates of national railroads shall not be augmented for mining enterprises; they will remain as established, as long as this depends upon the Government.

4. All employees and laborers in the active service of mines shall be exempt from any public employment, and also from military service in time of peace.

5. Mining enterprises are authorized to improve the actual roads and to construct new ones, according to the law of expropriation and the law of railroads.

6. Local and departmental authorities will lend all possible assistance to mining enterprises and give the necessary protection to those already in operation.

7. In case there should be immigration for mining enterprises, all immigrants shall enjoy exemption from taxes and imposts stipulated in the immigration law in the second and third paragraphs of the eleventh article.

8. All the above concessions shall last for 15 years, even if the fiscal and mining laws of the Republic should be reformed.



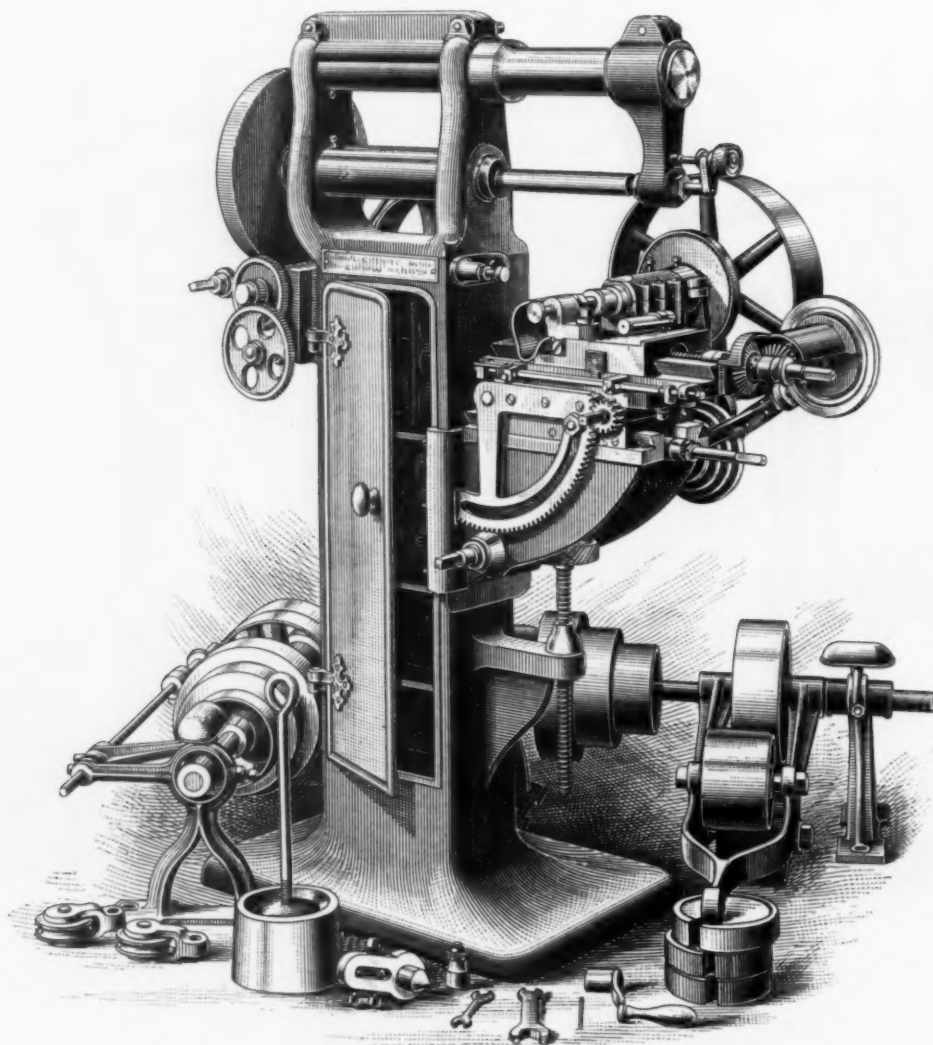
### The Brainard Gear Cutter.

The gear cutter built by the Becker-Brainard Milling Machine Company of Hyde Park, Mass., is automatic in all its movements. After being set and started, the cutter feeds through the gear blanks, returns rapidly to the starting point, the dividing wheel rotates to the exact place for the next tooth, and the operation is repeated indefinitely without further attention from the operator.

The essential feature of this spacing mechanism is the worm wheel, known as the dividing wheel, shown in Figs. 2 and 3. This wheel is built in two parts, the line of division being in the center of the rim, thus splitting the teeth equally. One of these parts is the wheel proper, A, Fig. 2; the other is a ring, B, let into the wheel so as to form half of the rim. The ring B is most carefully turned and the face is trued up on a face plate by scrap-

scope and scraping them to exact uniformity. In this painstaking way each dividing or spacing wheel is made ready to perform its important work.

The movement of the dividing wheel, which gives the necessary space to the teeth on a blank being cut, is brought about by a series of change gears, whose general arrangement is shown in elevation, Fig. 3. A bracket, A, capable of vertical adjustment on the frame of the machine, holds the worm C in position with the dividing wheel. This vertical adjustment is designed to take up the very slight wear of the worm against the dividing wheel. Into this bracket is tapped a stud, B, which carries a loose pulley and a tight pulley keyed to the gear E. The position of the driving belt is fixed by guide fingers, adjustable if necessary, and is shown overlapping the tight pulley sufficiently to drive the train of gears during the interval of spacing the teeth, but not so far as to pro-



THE BRAINARD GEAR CUTTER.

ing in the usual manner. The surfaces *a b* are thus accurately fitted into the wheel with the great care necessary to a perfect fit.

The next step toward completion—still far ahead—is the drilling and tapping of the holes C. These holes must be spaced with such accuracy that when the ring B is turned to bring one hole above any other in the wheel A all the holes will exactly coincide. The ring and wheel are now clamped together by the 12 machine screws, and the process of cutting the teeth begins.

A single cutter first roughs out the teeth—180 on a 36-inch gear cutter—leaving sufficient stock for the several finishing cuts taken by the hob, a cutter with teeth set on the same spiral as the worm which is to drive the wheel. The ring B is now turned around several spaces, six for example, on the wheel A, is again secured to the wheel and a second cut taken.

This process is repeated until a given hole in the ring has covered every other hole in the wheel, and at the final cut all inequalities in the teeth at the time of the roughing cut are almost entirely removed. The finishing touches are given by examining the teeth under a micro-

scope and scraping them to exact uniformity. In this painstaking way each dividing or spacing wheel is made ready to perform its important work.

It has been objected that this system of feed is not positive, but the record of "not missed a tooth in 15 years" is ample evidence to the contrary, and decides against the complications which arise in a more "positive" arrangement of feed.

The locking disk, connected to the dividing pulley by the gear E, consists of a graduated disk and the lock disk proper. On the circumference of the lock disk is a single notch, cut to receive the lock bolt, which is automatically withdrawn by the winding of a chain by one of the shafts of the cutter driving mechanism. The bolt returns against the circumference of the lock disk and prevents it from making more than one revolution, which corresponds to one tooth space on the blank. Thus the number of teeth cut on a given blank is dependent upon the amount of feed given to the dividing wheel, and that

is varied by inserting proper change gears between the locking disk and worm shafts. The graduated disk is clamped to the lock disk by means of bolts whose heads lie in a circular T slot cut in the lock disk. This arrangement permits the gear blank to be turned to any position and the amount of change read in degrees on the graduated disk, without disturbing the locking mechanism or belting, by simply loosening the nuts on the outside.

Numerous original devices to facilitate accurate and

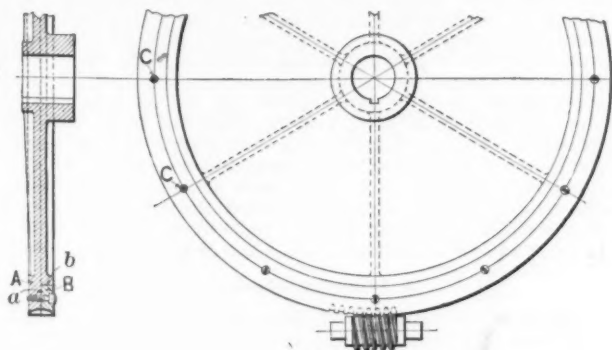


Fig. 2.—Dividing Wheel.

chine can be worked by hand, so the operator can make the adjustments and assure himself that all the machine movements are properly timed before making the automatic connection. It also allows the gear blank to be rotated to any position for examination after one or more teeth have been cut.

The change gears, 50 in number, are fitted in a wooden case occupying the body of the machine, each in its own compartment. Any gear, therefore, can be selected without loss of time, and all are kept clean and bright.

The machine is provided with a rack cutting attachment when desired.

The 18-inch machine, which is here illustrated, has the following dimensions:

|                             |        |         |
|-----------------------------|--------|---------|
| Diameter will cut           | 18     | inches. |
| Width of face will cut      | 4      | inches. |
| Extreme length of feed      | 64     | inches. |
| Width of driving belt       | 2 3/4  | inches. |
| Rate of feed per minute     | 2 to 7 | inches. |
| Weights } Gross             | 1,608  | pounds. |
| } Net                       | 1,315  | pounds. |
| Dimensions of case { Length | 48     | inches. |
| Width                       | 33 3/4 | inches. |
| Height                      | 67 1/4 | inches. |
| Economical limit of pitch   | 6      |         |

Our foreign commerce keeps up amazingly. The value of merchandise imported into the United States in the month of May was \$71,555,861, an increase of \$1,395,488 compared with the same month last year. The

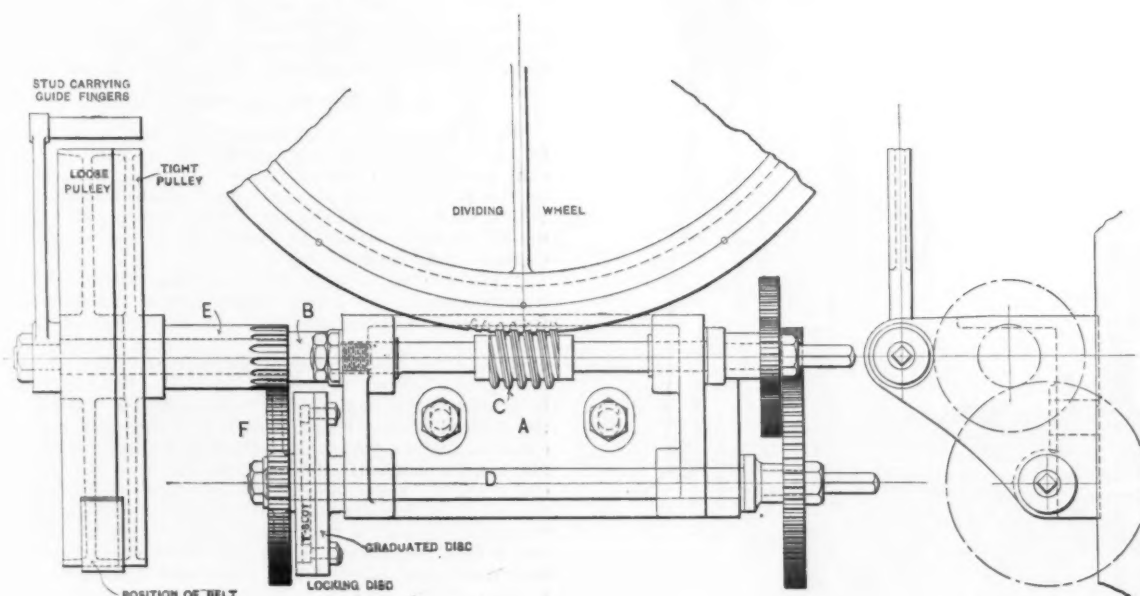


Fig. 3.—Spacing Mechanism.

### THE BRAINARD GEAR CUTTER

efficient work will be noted on the machine. A centering device fixes the exact center of the cutter without reference to the position of the knee or other parts. A dial reading to thousandths of an inch, connecting with the elevating screw, enables the cutter to be set to the correct depth without using line or depth gauges. One of the quadrants which sustains the cutter carriage at any required angle is graduated to degrees, and the cutter may be fed at any angle through an arc of over 90 degrees, running equally as well vertically as horizontally. The cutter carriage can also be set at any angle either way in a horizontal plane, and has a graduated scale defining the angle.

The automatic feed is so arranged that the feed cones and the feed belt run always in one direction, yet feeding both ways, and running back about 40 times faster than forward. There is no reversal of the driving parts, therefore no shock, the whole movement being smooth and practically noiseless even at high speeds.

The cutter spindle is not made solid, but has a long taper center hole to receive the cutter arbor, allowing any number or sizes of arbors to be used. The cutter arbor has an outer center support which not only prevents vibration, but allows smaller cutters to be used than is possible when the cutter spindle is solid.

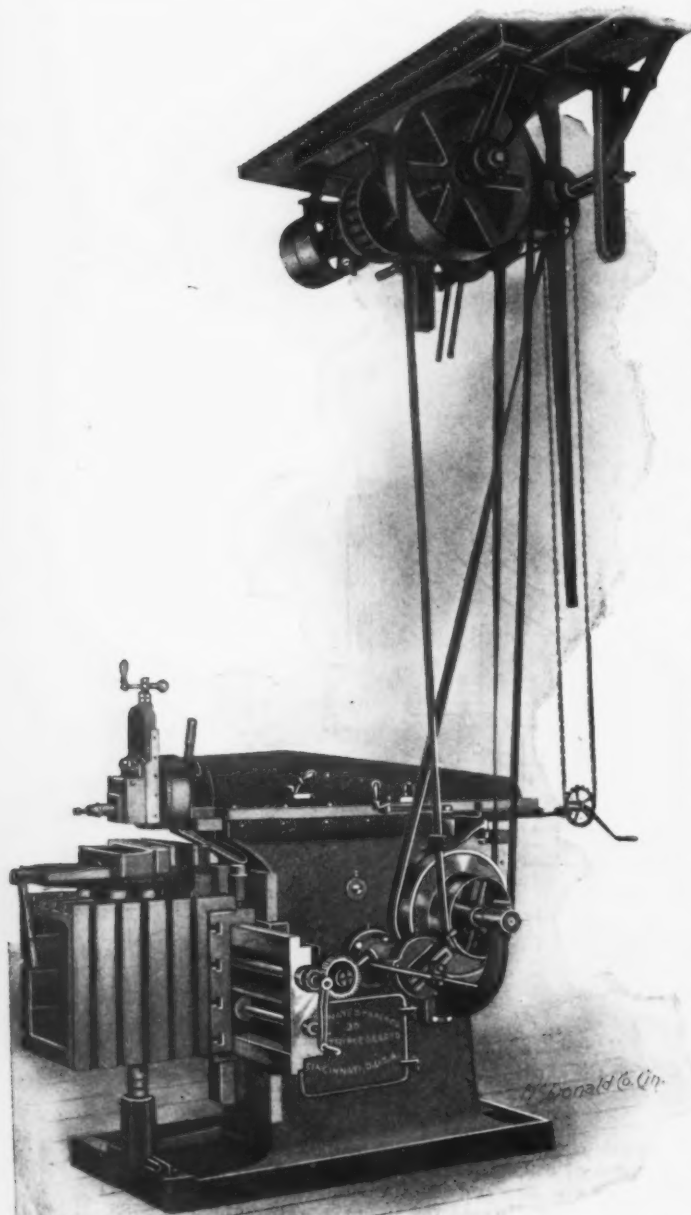
A radial clutch upon the feed screw connects and disconnects the feed works. When disconnected, the ma-

exports of merchandise were valued at \$113,503,577, an increase of \$19,662,330 over those for May, 1899, and establishing a new record for that month. For the 11 months ended May 31 the imports were valued at \$788,792,848, an increase of \$153,401,668 compared with the like period of the previous fiscal year. The exports for the 11 months aggregated \$1,286,214,534, an increase of \$155,585,459 over those for the corresponding months of the previous year, and establishing a new high water mark for that period. The balance of trade in favor of the United States for the 11 months was \$497,421,686.

The International Mining Congress, which was held last week at Milwaukee, Wis., closed its session on Friday, after effecting a permanent organization. The following officers were elected: President, L. Bradford Prince of Santa Fe N. M.; vice-president, A. P. Swineford of Alaska; secretary, H. M. Ryan of Colorado; treasurer, Mrs. E. G. Atwood of Colorado Springs. Executive Committee: J. W. Adams of Dahlonega, Ga.; Mrs. Haskell of Helena, Mont.; Judge Philo A. Orton of Darlington, Wis. A resolution was passed expressing the sense of the Congress that a national bureau of mining be established and that the chief of the bureau be a member of the President's cabinet. Boise City, Idaho, was selected as the place for meeting for 1901, and the third Tuesday in July was named as the time.

### The Cincinnati Triple Geared Rack Shaper.

The triple geared rack shaper built by the Cincinnati Shaper Company of Cincinnati is operated from a variable speed countershaft, by means of which the ram can be driven at any speed, from 9 to 45 feet per minute, upon the cutting stroke, while the return is always constant at the rate of 60 feet per minute. This combination provides proper speeds for the cutting of any metal, from the softest to the hardest. The machine is actually of triple geared construction, the power being increased three times between the driving pulley and the ram. The column is of unusual depth and width, and the ram



THE CINCINNATI TRIPLE GEARED RACK SHAPER.

guides project both in front and back. The ram is formed with a double rack, thus avoiding side thrust, and is ribbed and braced internally. The rail is ribbed vertically, and the cross traverse screw is furnished with a graduated collar. The head swivels at any angle and is graduated. The vise also swivels, has steel faced jaws and a graduated base. The elevating screw rests upon ball bearings. An opening through the column under the ram provides for the key seating of shafting and similar work up to  $3\frac{1}{2}$  inches in diameter.

This shaper has an extreme stroke of 32 inches, vertical travel of table of  $16\frac{1}{2}$  inches, horizontal travel of table 30 inches, feed to the head 7 inches, ram bearing in the column of 38 inches at 30-inch stroke, width of ram bearing 12 inches, weight 3500 pounds.

### Canadian News.

#### The Stove Foundry Amalgamations.

Dr. McCauley of Chicago, representing the American capitalists behind the promoters of the amalgamation of the stove foundry companies, was in Hamilton a few days ago. He states that the scheme is all but completed—that is, so far as ten of the manufactories are concerned. Real estate, buildings, plants and stocks have all been appraised by the syndicate's valuers, except in the case of one of the ten concerns, where the work is in progress. The new company will take in the works of the following: Copp Brothers, the Gurney-Tilden Company, the D. Moore Company, Barrow, Stewart & Milne, Bowes, Jamieson & Co., all of Hamilton; McClary Mfg. Company, London, Ontario; Clare Bros., Preston; James Stewart Mfg. Company, Woodstock; Buck Stove Company, Brantford, and the Smart Mfg. Company, Brockville. Neither book debts nor liabilities are to be taken over. It is stated that some of the works will be closed up and the make of stoves produced in them will be turned out from some of the other works.

#### A Nickel Railway.

Besides the Algoma Central Railway, F. H. Clergue is identified with another railway project—the building of a line from Sudbury into the copper country to the north. Forty miles of the line are to be built by Christmas, if the present plans are carried out. Much of the grading work is already done. The road will pass close to what is regarded as one of the largest ore deposits in the nickel range—that is, in the southwest corner of Snider township. This property, it is said, the Canadian Copper Company are preparing to open up and work.

#### A Banker on the Iron Outlook.

B. E. Walker, general manager of the Canadian Bank of Commerce, in his address at the annual meeting of that institution a few days ago, made some remarks as to the prospects of the iron and steel industries here, which, on account of the respect his utterances command on all matters affecting the material development of Canada, may be quoted:

"We are witnessing extraordinary developments in iron and coal. For a few years Europe has bought iron from North America and now she is asking for coal, the rapid rise in price and fear of actual famine having even affected the shares of British railways and other enterprises largely dependent on coal. We can assuredly supply both coal and iron to Europe cheaper than the United States, and if this is a permanent change in consequence of which Europe will afford a continuous market for both articles, although a varying one as to quantity, we shall be able at last to develop our great stores of both minerals and build up manufactures in iron and steel on a scale which seemed quite impossible but a few years ago, while the effect on our own railway and other construction work and upon our existing manufactures which require iron as a raw material must be most helpful to Canada as a whole. The fact that the recent rise in the prices of iron, lumber and other structural materials was so unreasonable in its proportions is unfortunate, and the check which has already been administered need cause no surprise. When prices go beyond a certain range construction work of almost all kinds is greatly reduced as the natural result. There is not as much railroad or house building or construction of any kind going on as last year, and doubtless in view of the strain on the money market this is just as well. Still, from cities and towns, large and small, throughout all Canada we hear the statement repeated that houses are well occupied and that there has been a decided improvement in rents. Reports from 12 or 15 manufacturing towns and cities in Ontario state that almost all classes of manufactures have done an unusually large and profitable business during the last year, and that the demand for all classes of goods, except structural materials, continues."

#### Minor Notes.

The Gould, Shapley & Muir Company, Brantford, are about to add another branch to their works, proposing to engage in the manufacture of gasoline engines.

V. L. Emerson, who established some time ago at New Edinburgh, near Ottawa, an experimental plant for the manufacture of sawdust into pure carbon, wood oils, wood alcohol, &c., is arranging for the manufacture in Canada and the United States of machines for a much larger plant of the same kind in Ottawa. In the bed of that river there is an immense accumulation of sawdust.

Port Colborne defeated by six votes the by-law for bonusing a blast furnace on the Welland Canal.

Application is about to be made to the Dominion Government for a charter incorporating the Canadian



Motor Vehicle & Battery Company, with a capital stock of \$2,000,000. Hamilton is to be the headquarters of the company.

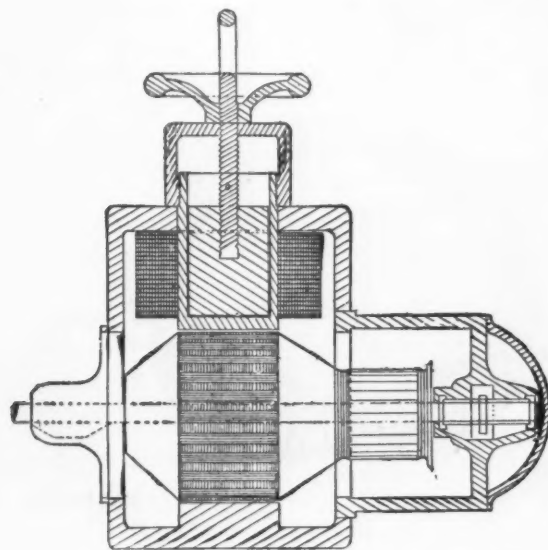
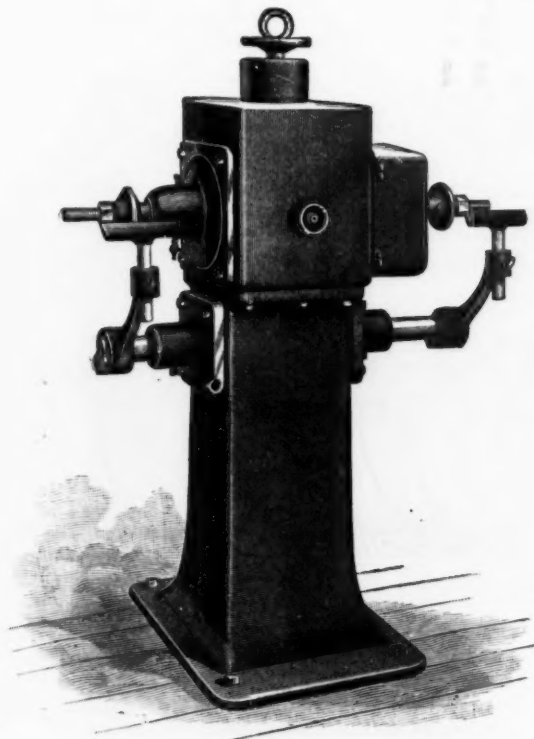
Negotiations are pending for the establishment of an automobile company in Ottawa.

The Canadian Cycle & Motor Company opposed the other day the application of the Miami Cycle Company of Ohio for the revival of a patent taken out in 1896 for a bicycle crank hanger, and which lapsed through failure to comply with the patent law. The application was finally thrown out by the House Private Bills Committee.

C. A. C. J.

### Multispeed Electric Emery Grinder.

The grinder here illustrated—made by the Stow Mfg. Company of Binghamton, N. Y.—will drive two 2 x 14 inch emery wheels at any speed between 960 and 1600 revolutions. Starting at the proper speed for these wheels, as they wear away it can be correspondingly increased so that the proper peripheral speed can always be maintained, thereby allowing the emery wheels to



Vertical Section through Spindle.

### MULTISPEED ELECTRIC EMERY GRINDER.

constantly cut to the best advantage. How this is accomplished will be understood from an examination of the sectional cut. The armature shaft of a variable speed electric motor is extended so as to carry the emery wheels. This arrangement makes a self contained machine, which may be placed in any position most convenient.

### Central Pennsylvania News.

HARRISBURG, June 25, 1900.—“The situation is not entirely satisfactory,” said an official of one of the larger steel concerns to-day, “but if we had experienced such times as these four years ago we would have thought ourselves in clover. Things are bad only by recent comparison. There has been no collapse, and there is no danger of such an ending of the boom period which started last year. Prices soared too high, and we are trying to get back to normal conditions. That's all there is to it.”

This opinion, with a few slight variations, is practically the opinion of most of the iron and steel men of this district. They would like the uncertainty regarding prices dissolved, but they do not fear any considerable slump. So far as the prices are concerned they are expected to slide downward in some cases, but in others they are apt to go upward. There has been too much divergence between certain raw materials and the finished product for comfort, and when this state of affairs

is remedied there is likely to be a very different and far more satisfactory market.

Billets and slabs have been dropping off, owing to the diminishing orders for plates, and the increased capacity of the plate mills has had something to do with the dullness in that branch of the iron and steel industry. When the prices advanced there was a large increase in the capacity of various plants by enlargements, and this increased production means a more prompt catching up of supply with demand. Just now some interesting inquiries are being made in this territory regarding plates for several large vessels, which will be built without reference to the ship subsidy bill, which held out prospects for a lively plate trade in this district. It is believed that the bill will surely pass at the next session of Congress, and that there will be a great revival in the plate business in consequence.

An interesting fact in connection with the first shipment of rails to Honolulu by the Pennsylvania Steel Company was the manner of shipment. There were 3000 tons of girder rails in this order for the Honolulu Rapid Transit Company, and they were rushed across the country a few days ago in three solid trains via the Great Northern Railroad to Seattle. This shipment was made without delay, and was most satisfactory in every particular. The same company have recently booked orders for almost 4000 tons of rails for foreign delivery. President Felton remarked in a recent interview for *The Iron Age* that the demand for American iron and steel products abroad was the significant development of

the industry during the last year or two. He looks for the foreign trade to hold level the business of this country and to increase the output.

The Harrisburg Foundry & Machine Works have recently turned out for the Manhattan Electric Railway four powerful tandem condensing compressed Harrisburg standard engines, which will be utilized in driving the exciters for the big generators. These have direct connection, and are of the self lubricating type. It is a fact that these engines were procured from the works here at a much higher price over all competitors. The plant is running full and there is plenty of business ahead.

The representative of a large scale manufacturing concern said to-day that the demand for wagon scales is very heavy—larger than for years. He says he is constantly on the jump and that the company have never had a more satisfactory year.

There are few plants that are idle. Here and there a department will close down a few days, but for the most part the various mills are running.

A meeting of the directors of the Duncannon Iron & Steel Company will be held at Duncannon this week. It is probable that the future policy of the company will be announced at this meeting, the first held since President Wister's death.

The Pennsylvania Steel Company have received the first lot of an order for 500 compressed steel cars. They bear the name of the company.

A few days ago a large gang of skilled constructors left the Pennsylvania Steel Works for Cuba to erect the

steel pier of the Cuban Iron Company, about 30 miles from Santiago. They will also erect a number of bridges and other structural work. A large shipment of materials for this work was made last week. This work was somewhat delayed by the absence of a large construction force on railroad work at Richmond, Va., and later by the rainy season in Cuba.

Work on the railroad extensions and foundations for new plants at the Pennsylvania Steel Works is progressing rapidly. Practically all departments are in operation. The bridge and construction and frog, switch and signal departments are particularly busy.

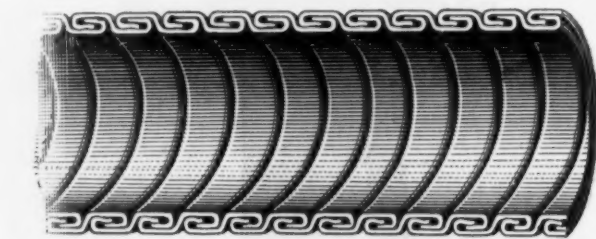
The old Watts furnaces, at Marietta, are being dismantled. The old machinery is fit only for the junk shop. These furnaces were among the most noted in the Lancaster County group, and were owned by the Watts family. They had a long season of prosperity, but now give way before modern methods.

The Standard Steel Works, at Lewistown, are running day and night with 1000 employees. The Logan Iron & Steel Works, the American Axle & Tool Works and the Mann Edge Tool Works, at the same place, are also in steady operation, and Lewistown is booming. It is said houses cannot be built fast enough to supply the demand.

S.

### Flexible Metallic Tubing.

Samuel Harris & Co. of 25 South Clinton street, Chicago, are the agents in this country for the flexible metallic tubing here illustrated. It is designed for water connection between tender and locomotive, for connecting cars for air, gas or steam for heating, for connecting boilers with movable engines, for conveying com-



Section of Tube.

### FLEXIBLE METALLIC TUBING.

pressed air to drills and the like. It is made in various diameters in bronze, copper and steel. The construction of the tubing will be understood from the longitudinal sectional elevation. The strip of metal constituting the tube is bent into a S form. The ends interlock in such a way as to make a steam tight joint, and at the same time permit a certain amount of slip when the tube is bent.

Captain John Mitchell, general manager of the Aetna Steamship Company and the Cleveland Steamship Company, last Saturday closed another contract with the American Shipbuilding Company for a large steel steamer, duplicating the order placed the previous week. The new boats will be the same size as the steamer "William E. Reis." They will be 436 feet over all, 416 feet keel, 50 feet beam and 28 feet deep. They will have triple expansion engines, with cylinders, 23, 25½ and 63 inches by 42-inch stroke. Steam will be furnished by three Scotch boilers, and they will be equipped with the Ellis & Eaves induced draft. Both steamers will be built at the Globe yard, in Cleveland, and they are to be completed and ready for business by the opening of navigation in 1901. The price was not given out.

The Pelton Engineering Company, Cleveland, Ohio, manufacturers of electrical appliances, have entered the machinery trade as dealers and sales agents for new and second-hand machinery. They have just issued a special bargain list of machine tools for immediate delivery, including numerous lathes, planers, shapers, milling machines, drill presses, hammers and other tools; also a fine lot of engines, generators and motors. E. L. Bosworth, formerly in charge of the machinery department of the Patterson Supply Company, Cleveland, has become associated with the company in charge of the new department.

### Russia's Copper Industry.

The copper industry is one of the oldest industries of Russia. It had prospered there for a long time before it was developed in other countries, which have since far outstripped the Russian industry. It was Russia which formerly supplied the whole of Europe with copper, and up to the year 1860 the exports of copper from Russia to the principal foreign markets were considerable.

In 1860 the copper production of Russia attained its highest mark, 410,000 poods. (A pood is 36 pounds.) After that the situation entirely changed, partly on account of the abolition of serfage, but chiefly on account of the economic policy of the empire, which, by promulgating the tariffs of 1857-70, hampered the further development of the Russian copper industry.

The part taken at present by Russia in the total production of copper is but unimportant. In 1898 the total production of copper in the world amounted to 432,905 tons, to which Russia contributed but 6140 tons.

Russia nowadays takes the last place among the ten principal producers. Its exports have decreased to insignificant quantities.

The imports have since 1860 steadily been on the increase, as shown by the following figures:

|                                  | Poods.  |
|----------------------------------|---------|
| 1851-1860 (annual average) ..... | 16,500  |
| 1861-1870 (annual average) ..... | 117,300 |
| 1871-1880 (annual average) ..... | 408,100 |
| 1881-1890 (annual average) ..... | 235,700 |
| 1891-1895 (annual average) ..... | 634,600 |
| 1896 .....                       | 960,000 |

It must, however, be borne in mind that these figures are a little too high, as the Russian statistics include aluminum and nickel in the item "copper." But these two minerals are imported into Russia in very small quantities.

The copper working industries of Russia have made great strides, as will be seen from the following table:

| Years.     | Number of works. | Value of product. | Workmen employed. |
|------------|------------------|-------------------|-------------------|
| 1880 ..... | 237              | \$5,032,000       | 7,080             |
| 1885 ..... | 217              | 4,927,500         | 7,351             |
| 1890 ..... | 307              | 4,982,000         | 6,083             |
| 1896 ..... | 250              | 17,124,500        | 19,325            |

The manufacture of rolled copper is especially developed in the governments of St. Petersburg, Moscow and Vladimir; that of copper for bells in Moscow, Petersburg, Jaroslav, Charkoff and the Don Territories. Mention should also be made of the manufacture of lamp burners, which up to a few years ago were almost exclusively imported from Germany and Austria. At present, however, there are important factories at Warsaw, Moscow and St. Petersburg. Two branches of the Russian copper industry deserve special mention—viz., the manufacture of bells and that of samovars (tea urns.)

The manufacture of bells has for centuries been carried on with great success in Russia. On account of the immense number of churches throughout the empire, the demand for bells has always been great. As far back as in 1653 the celebrated bell, called "Tyar Kolokol," was made. It is the largest bell in the world, being 16 feet in diameter and 19 feet high. No less than 11,000 poods (198 tons) of copper were used in its manufacture. The principal foundries are in the governments of Moscow, Novgorod, Penza and Poltava. In the cottage industry only small bells and the so-called bubentchik, for harness purposes, are made. The principal seat of this industry is Valdai, in the Novgorod government.

The chief seat of the samovar industry is the city of Tula, called the Russian Sheffield, as it is at the same time the greatest Russian cutlery manufacturing center. Large quantities of samovars are also made in villages of the Tula districts by the Kustars. The latter generally do not work for their own account, but receive orders from Tula manufacturers, who also supply



the necessary raw material. The Sergievsk Volost alone makes about 40,000 samovar bodies every year for the Tula manufacturers.

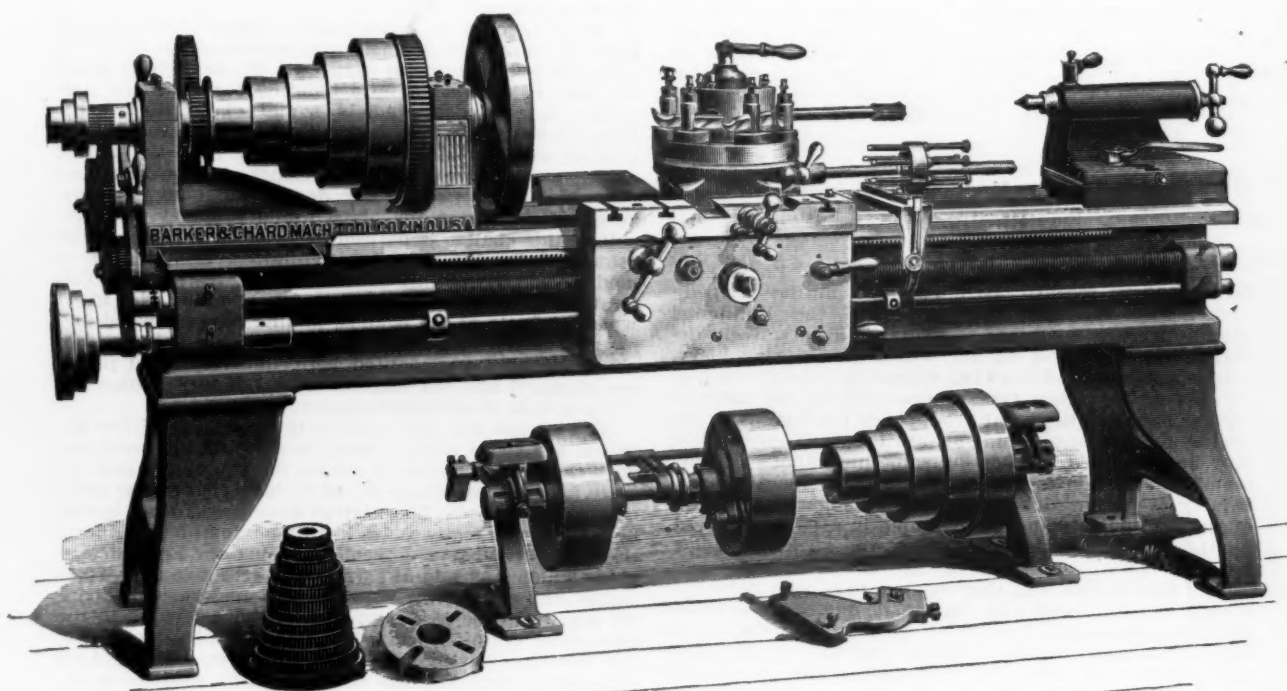
The total annual production of copper utensils in Russia is valued at about \$4,500,000.

#### The Barker & Chard Lathe Turret Attachment.

The accompanying engraving shows the standard 18-inch engine lathe, built by the Barker & Chard Machine Tool Company of Cincinnati, provided with their recently designed turret. This is a radical departure from the ordinary forms of turrets. It is carried on the carriage of the lathe, and its lower flange is so arranged that the tool block or special tools of any description may be placed in position for doing the different classes of work. The tool blocks are arranged so as to give a fine adjustment to the tools and can be placed in position to do the turning as readily as the tools on the regular engine lathe. The turret is arranged to do turning, boring and facing, or the kind of work usually done by a screw machine. Just at the side of the turret is a group of adjustable stops, one for each tool of the turret. These stops can

in the way of machinery and articles of all sorts have gone North on the big fleet which has, though, by the way, been stopped by the ice. At present writing some have started overland from the furthest accessible point North. Of course machinery and railroad supplies cannot be got in that way, and their owners will only have to bide their souls in patience. The business is practically over now for the season, and there are only a couple of vessels up for the Cape. The number of people who have left there from this city, Seattle, Dawson, and elsewhere, added to the number already there is estimated at 25,000. News is filtering in slowly from the fleet.

A couple of mishaps have occurred to vessels, and our British friends from Victoria have landed merchandise and passengers on the beach quite as soon as Americans, despite the fact that they have no legal right to trade between American ports. The finds are richer than ever, and one enthusiastic gentleman connected with the W. S. Kimball Company says that in the next two years Cape Nome will have added \$100,000,000 in gold to the wealth of the world. And the promontory from which the gold field derives its name is said to be a mass of rock, in some instances yielding as high as



THE BARKER & CHARD LATHE TURRET ATTACHMENT.

be adjusted independently of each other, so as to regulate the work done by each tool. The stops are moved automatically, so as to bring each into line with its particular tool. Since it is built in all sizes, this turret can be fitted to any of the engine lathes built by the company.

#### Pacific Coast News.

SAN FRANCISCO, June 18, 1900.—We have had during the past week the unusual phenomenon of two rainfalls in summer. Neither were very heavy, and though some harm resulted to the ingathering of the harvest, it was, on the whole, very little. We have been unusually favored in regard to crop weather this year. The advance lately made in wheat has been a source of a good deal of satisfaction, and cheerful hopes are entertained that prices will ere long reach fairly remunerative figures for the grower, for this is the basis of all other business in this State. Advices from the North are equally satisfactory as regards the harvest yield, or, rather, the prospective yield, as they do not come into the market until after we do.

The clearing house exchanges continue to give a good account of the business of the year. They are still in excess of those of 1899 for the corresponding period, although not as much ahead as they were earlier in the year. In some directions the Cape Nome business has been a godsend, and the sales for it and the other Northern gold fields have been very heavy. Mining supplies

\$750 to the ton. In fact if the finds continue to be as many and as rich during the summer as they have been in the inclement season people will find their way to the new Eldorado from all quarters overland when the ocean route is closed by pack ice.

For the first year or so of its existence Cape Nome was looked upon as a fake, so that those who first became acquainted with its riches had ample opportunity to pick out the cream of its claims. But it is after all only a small portion of the immense territory provided for us by Seward's thoughtfulness, and taking the most conservative view possible, it is not too much to say that the end of its riches no man can foresee. It will require rail communication with the sea, however, to develop the interior. Little is known as to the navigability of its rivers, and what little is known outside of the Yukon is not favorable.

This is the quiet season of the year, and price changes of any kind affect the volume of business to no particular extent. I anticipate a very good demand for most descriptions of iron and steel goods this year on the coast, as the current of prosperity still continues and we have been favored with good crops. There is very little talk heard about political matters just at present, and I do not believe that the campaign will affect the current of business to any appreciable extent. Of course our people are vitally interested in what is going on now in China, and all recognize that the result will probably be the opening up of trade with the Celestial Empire to an extent heretofore undreamed of. Indeed, some think that one of the probabilities of the outcome is the open-



ing up of such extensive markets for Pacific Coast cereals in the Orient generally that we will cease to look to Europe for their sale. And while this idea may be too far fetched it no doubt has solid business considerations to support it. Oregon and Washington have been doing a good business that way, but California's share in it has been confined principally to flour. And other goods will follow it, and from Pacific Coast buying centers, too. The "Hong Kong Maru," which sailed the other day for the Orient, had machinery valued at \$12,000 for Vladivostok in her cargo. Our shipments of machinery to the Hawaiian Islands keep up as briskly as ever.

The plague scare is at an end, having been killed by the action of Judge Morrow of the United States District Court, and the action of the Treasury Department in lifting the State quarantine. And here I may say that the quarantine referred to was confined practically to Chinese during its ephemeral existence, and that as far as any real cause was at the bottom of it it might as well have been extended to New York City. It is now weeks since we have had even an alleged case of plague. And the general feeling is that there has never been any. It was thought for a while that it would affect business very seriously, but as it was never taken very seriously by the people at large it has not interfered with it as far as I can ascertain to any extent.

The "Gaelic" has had 1969 ingots of Straits tin, and the "Mariposa" 439 ingots of Australian. The "Luxor," from Hamburg, had some consignments of steel and spelter. The "City of Sydney" had 1247 packages of hardware, &c. The "City of Para" had 8551 packages of hardware, wire, &c. We continue also to receive consignments by way of the Canadian Pacific of tin plate, &c.

J. O. L.

### The Demand for Modern Machinery in the Philippines.

ILOILO, ISLE DE PANAY, P. I., April 27, 1900.—Your correspondent recently accompanied a military expedition across the southern islands of the Philippine group, and was surprised to find that a very lively demand was springing up for steam power machinery, water wheels, wood working apparatus, metal machinery, sewing machines, typewriters, bicycles and machinery for handling the great products of the islands in the woods and the sugar and tobacco crops. Your readers may be interested in knowing something about this demand and how to meet it. First of all, American machinery is preferred by the old time sugar mill owner of the Philippines, and his example is usually followed by the others, for the reason that the sugar mill men not only control nearly all of the vast industrial interests of the islands, but they are the ones who have the money, own the lands and the forests, and many of them are the residents of the cities, towns, or barrios. The sugar mill men are all Filipinos, Spanish or Chinese, and all are very rich, for the sugar mills have paid enormously here for many years. During the past few months there have been Americans prospecting with a view of securing control of many of the sugar mills, fitting them out with steam or water power machinery, modern devices and improved methods. Americans have also looked about to see what can be done concerning the controlling of the vast forests of woods and working them with modern machinery. There are immense forests of the most excellent hard woods here, which are simply chopped into fire wood or used for making the most inferior or common place articles. The native carpenters think nothing of using a nice board of mahogany for the side of a pen for caribou or pigs. The rich red woods and black walnuts are chopped for fire wood, and are used for building purposes as if the stuff were cheap pine. There is no pine here, and only the hard woods can be used for building and constructive purposes.

As fast as the American troops have advanced in the interior on the islands of Luzon, Panay, Cebu and Negros, new territory has been opened into which Americans have poured with goods for opening stores and machinery for starting sugar plants, wood working machinery, printing presses, and the like. The result is that there is a great demand for motive power machinery. It seems that many of the enterprising persons who came to these islands with a view of beginning the manufacture of some product relied upon the water powers to a considerable extent. It was supposed that the rivers could be dammed and the proper head of water secured to run a turbine. But there is a dry season here from November to June, when the rains cease to fall, the earth becomes baked and cracked with dryness and heat, and the rivers run almost dry because no rains fall. During this time the water wheels would be at a standstill. On the other hand, in the middle of the rainy season the rains fall so heavily that the rivers are

overflowed and the earth becomes a miry, spongy mass. During this period there would be back water much of the time, thus putting the water wheel out of service. The surest way to get a steady power in these islands is by using steam boiler and engine. The natives use the caribou for turning walking beams, but this is slow and unsatisfactory.

As soon as an improvement is put in at one place others want the same. I have seen an engine put into a sugar mill, and every day thereafter some native sugar mill proprietor comes in from a distance to examine the outfit, and in nearly every case he either tries to purchase the plant for his own use or learns how he can get one like it. I have seen a plant which cost \$2000 in the United States, and about \$300 to get it here, sold for \$10,000 to a rich sugar mill owner, who paid the cash down. These mill owners do not hesitate to pay out money for improvement, now that they know that their property will have the protection of the American troops. Formerly the Spanish soldiers looted as well as the bandits of the islands, so that between the Spanish and the mountain guerrillas the sugar mill owner had little chance to hold on to his property. No one bothered his crude outfit of turn beam and rolls operated by animal power, but if he possessed an engine he would have no peace until all the brass work and small parts had been stolen. In fact, he could not keep any of his plant complete.

One has only to cross these islands of the Philippines to observe the remarkable advancement which is going on in every line of industry. In the days of Spanish rule, if a man put up a building for industrial purposes, the Spanish officials would claim duties, the Spanish soldiers would confiscate property, and the ladrones would steal the products, so that the native owner would soon go out of business. If he starts an industrial enterprise of any description now he is assured of protection for himself and property. The result of this change is noticed in all of the islands of the group. Native and foreign capitalists are putting in modern sugar working machinery, harvesting and cultivating machinery, apparatus for handling the great wood products of the islands, mining devices, wood and metal working machinery of all sorts. Not only are machines of all types wanted here, but very good prices are obtained and sales agents of machinery houses are doing a very profitable business.

The agents who are making the most out of the situation are those who brought samples of the machines with them, with a man to set up the machinery and operate it in a place where it can be inspected by the prospective purchasers. The natives have been fooled by the Spanish for so many years in this buying of machinery, that they are chary. I recollect seeing one Spanish machine which was sold at a very high price to a native machinist, and which was supposed to be modern, which bore the stamped date 1844, and was worthless, owing to the absence of certain parts which could not be duplicated. The machine was painted up in fine style, and appeared to be new. This machine could never be made to work. There are numerous instances of the kind. Spain had a habit of using the Philippines for a dumping ground for rejected machinery. Spain would ship only old hand presses here, and the only paper of the Isle of Panay was printed on a Franklin hand press, with lever, as late as last December in Iloilo. The same printers now have American types of presses, and are making a very large amount of money by running a job office in connection with their little daily sheet. Formerly the proprietors had difficulty in earning enough money to pay expenses. They now do the printing for the business houses of about 20 cities, 100 towns and some hundreds of barrios on this Isle of Panay. There are no printing establishments on the Isle of Mindanao, Cebu or Negros, and the firms there requiring bill heads, &c., have to send to Iloilo or Manila. Some send as far as the United States to get printing done. Most of the presses are operated by foot power, but in Iloilo they have put in an engine, and in time there is going to be a good call for engines and boilers for this service.

It is very advisable for agents of steam goods houses, printing presses, typewriters, &c., to be furnished with small working models of all machinery represented by them. I noticed that one agent of an electric road concern from America was here with plans and specifications for the putting in of an electric road to connect the cities and towns of the islands. The whole thing was planned out in magnificent shape, and was thoroughly correct. But he could hardly get a native interested. On the other hand, a party who was here for the same purpose, and represented another firm, had with him a complete little working model of a power house, tracks and cars, and arranged to put his apparatus in operation on the floor of a large room. This room was always crowded with the wealthy natives of the islands, who invested their money in the stocks very liberally. The man with the same thing on paper could not sell

any stock, while the man with the working model had only to show his little mechanical device and the rich native would invest. The same idea prevails concerning all machinery offered for sale here. There should be complete working models of flour mills, printing outfits, typewriters, &c.

If a representative of a sewing machine company could arrive here now or within three months from now with a shipload of good grades of sewing machines he could sell them all on the wharf at advanced prices and make a great deal of money. When Spain was in charge of the islands, her one idea seemed to have been to abstract money from the people. If the people wore clothes, this meant just so much money less for Spain to draw from, as clothes cost money. So Spain encouraged the natives to go without much clothing. But the Americans have no such ideas, and about the first order the United States officers of the troops issued was for the male natives in breech cloth to get into white duck suits. This order was carried out, and the result was that every sewing machine in the islands was set to humming night and day to make new white duck suits for the millions of natives who had thus suddenly been ordered into clothes. The crudest sorts of worn out old sewing machines were bought and sold for about ten times their first price, for all the native and other tailors wanted machines so as to meet the new demand for white clothes. Many machines came in from other countries soon after, as ambitious agents and tailors cabled for some. I saw some of these machines, and many of them were the rejects of other countries and suitable for the junk pile. One tailor showed me with glee a nice little sewing machine he had bought for about \$75, gold, and which upon looking at I saw was one of the first kinds of sewing machines to be introduced, and operated by a hand crank. He now works it by running the cranked portion with belt and wheel from an overhead shaft, as he uses power in his shop.

The average native is a sort of a mechanical genius, and he can quickly be taught to run engines and care for machinery. Native labor is so much cheaper than American that many American manufacturers employ natives for firing, engineering work and mechanical work about a plant, for they work for about 25 cents per day and care for themselves. There have already been some oil and gas engines put in for use in running small power establishments, and these machines are cared for by native attendants who do the work well after a little instruction. There has been no one here as yet to represent oil or gas engine concerns, and what engines of this type have been put in here have been ordered singly by individuals. If there were a regular agency established in Manila, Iloilo, Cebu and on the Isle of Mindanao, a large business would result. I have personally interviewed many small manufacturers of combs from caribou horn, workers in metals of the islands, &c., who want small power producing devices, and who would order at sight and pay well.

The recent advancement in all things pertaining to the native, his mode of living and his method of working has brought about some remarkable changes in the brief space of eight months. Eight months ago the rebel army occupied positions near all of our strongholds in seaport towns, and everything concerned was riot and confusion. As soon as the Americans broke into these insurgent armies and sent them to the hills, there to disband practically, the thoughts of the native have run in other channels. Instead of fighting he now wants things peaceful and modern, and the Americans are teaching him some very good lessons. Probably there are 100 typewriting machines in the islands of the Philippine group. In Iloilo there are ten machines, and these machines are the wonder of the rich natives and the business men. Any one having a \$100 typewriter here can sell it for \$250 any day. There are some thousands of rich native families on the Isle of Panay alone, and they do not hesitate to purchase the modern things as fast as they know of their existence and use. The typewriting machine in the possession of your correspondent has seen service in America for several years, yet would bring \$250, gold, any time. There are no typewriter agencies in any of the islands, except at Manila, where there are two, recently established, but these do not do the natives of the other islands any good, for the native will not buy a machine on the strength of its advertisements, no matter how plainly it may be illustrated. This is because Spanish dealers in machinery fooled him so much in the past. The Spanish agents would get the money in advance on the strength of nicely colored plates printed of the machine on paper, and would then send the natives some worn out, old broken down out of date machines.

There are very few bicycles in use in the islands of the Philippine group, but there is room for many. The natives will buy bicycles if given a chance. They now crowd about a rider and want to see all parts of the

wheel, try it, and usually finish by offering the owner about five times the value of the machine to part with it, which he usually does not do. Since the American authorities have commenced using captured native larders and bandits from the mountains for work on the streets and roads, the latter have become quite suitable for wheeling. A year ago a bicycle could not have been used except on the streets in and about the larger seaport cities, but it is practicable to go almost anywhere on a wheel at present, especially in the dry season. There are two or three wheel agencies in Manila, and one agency in Iloilo, the latter having just opened, and the agent has sold no wheels for the reason that he made the mistake of bringing with him only pictures of the wheels, intending to sell upon the strength of these, taking payment in advance and having the wheel reach the purchaser in about three months after the deal is made. Had he brought about 1000 wheels with him, he could have sold them all the next day at prices averaging double the American value.

There is not a wind mill in use in the islands of the Philippines, and probably there is no country in which wind mills are needed so much as here, and no place, certainly, where the mills could be worked under such favorable circumstances, for the islands are all so situated that there is a sea breeze across them at all times, and of sufficient force to maintain the evolutions of the ordinary wind mill. The mills are needed here to pump up water. In every city and town of importance about 100 natives are required to laboriously pump up water to the proper elevation for tanks and other purposes for needs of city uses. In some of the cities they now have the streets watered, and the water all has to be raised by hand pumps to an overhead tank from which to fill the water carts. Water for drinking purposes in even the small barrios is all pumped up by hand and drawn from as required by the people. Wind mills could do this work better and cheaper. But the natives do not know what a wind mill is. They have never seen one, and although the writer has spoken with the managers of the towns, these natives do not know what is meant. They are, however, very willing to purchase the required outfit of wind power machinery for water raising purposes in any of the communities. There is a call for the best grades of mills, and worn out machines ought not to be sent here. Very good values can be obtained, and the parties providing the wind mills can afford to ship in the best designs of modern mills.

G. D. R.

**Track Elevation in Chicago.**—The Chicago City Council, on the 18th inst., passed an ordinance for the elevation of another batch of tracks, which is deserving of special notice, as the length of tracks affected is longer than that provided for by any other ordinance for a long time. The ordinance provides for the elevation of the Pittsburgh, Fort Wayne & Chicago tracks, between Eighteenth and Fifty-fifth streets, and the tracks of the Chicago & Western Indiana Road, between Eighteenth and Seventy-second streets. Each road has several tracks side by side, and the roads run parallel and near together most of the distance. The work will involve the elevation of about 55 miles of yard tracks of the P., F. W. & C., and altogether about 180 miles of track. The subway under all of the tracks at Fifty-first street will be about ½ mile long. The estimated cost is \$10,000,000.

The Union Development Company, who will control the building of the new town at Webster, Pa., on the Monongahela River, where the Union Steel Company have located their big rod, wire and nail plant, have selected the name of Donora in place of that of Webster. The name is probably adapted from a portion of the name of W. H. Donner, president of the steel company. The Union Steel Company have started the excavations for the foundations of their big mills. Engineers have been surveying and plotting the site of the town and mill, and everything is being hurried for the arrival of material. The Pittsburgh, Virginia, and Charleston Railroad Company will construct a line into the mill portion of the town.

Pittsburgh and Allegheny business men have struck a rich deposit of manganese ore at a place called Habersham, in the hills of Northern Georgia, and have organized a company to develop it styled the Pittsburgh & Georgia Manganese Company. The first lot of the ore taken out is ready for shipment, and from now on the output is expected to be regular and of good proportions. The company were formed by Dr. T. C. Van Kirk and John Cunningham of Allegheny, T. J. Jones, manager of the Oliver Iron & Steel Company, and H. D. and G. T. Hildebrand of Pittsburgh.



## Washington News.

### The Eight-Hour Bill.

WASHINGTON, D. C., June 23, 1900.—The leading manufacturers in the iron and steel trade are determined that if the pending Eight-Hour bill passes the Senate it will not be for lack of enlightenment as to the effect the measure would have upon the most important industries of the country. The statements made to the House committee were chiefly those of Eastern firms, but the Senate committee is now hearing from large manufacturers in the interior of the country who have become aroused to the dangers that menace an important class of their trade. A succinct and forcible brief setting forth some of the strongest objections to the bill, especially from the standpoint of those firms seeking to develop their foreign trade, has been prepared by the Leland & Faulconer Mfg. Company of Detroit, Mich., manufacturers of machine tools, special machinery, &c. During the recess of Congress the Senate Labor Committee will be represented at the Capitol by its clerk, who will receive and file briefs and who will forward to the chairman, Senator Kyle, such communications as it is desired shall receive his immediate personal attention.

### The Turret Question Settled.

June 26, 1900.—The Secretary of the Navy yesterday decided the long pending controversy concerning the disposition of the turrets of the new battle ships, including those recently authorized by Congress, and thereby opened the way for the immediate designing of and contracting for the 14 war ships, to cost more than \$60,000,000, carried by the last naval appropriation act, the plans for which will be drawn and the contracts let within the next few months. It is Secretary Long's expectation that the plans will all be in the hands of the successful bidders before the end of his present term of office, which expires March 4 next.

The decision of the Secretary concerning the placing of turrets is embraced in his formal approval of the recommendation of the special board which, after devoting a long time to careful consideration of the subject, has advised that three of the new battle ships be built with two of the four 8-inch turrets superimposed on the 12-inch turrets, and the other two located in the waist on opposite sides of the ship on a plane with the 12-inch turrets, and that the other ships carry four 8-inch turrets on a plane with the 12-inch turrets, quadrilaterally arranged, one fore and one aft on either side of the ship. This decision, which is a compromise between the contentions of the advocates of the two plans of construction, like compromises usually, is not wholly satisfactory, and will occasion considerable regret, chiefly for the reason that it is the aim of those responsible for the designing of war ships in all important countries to reduce the number of types as much as possible and to maintain uniformity and interchangeability wherever it can be done without sacrificing efficiency.

For more than a year the Construction Board of the Navy has discussed, *pro* and *con*, the advantages of the two-story or superimposed turrets, which have been installed on the "Kearsarge" and "Kentucky," as compared with the one-story turret for the larger rifles with separate broadside turrets for the guns of smaller caliber. Finally, the Construction Board, by a vote of 4 to 1, decided against the superimposed turret, but provided that a clause should be left in the contracts, making it possible for the Secretary of the Navy to modify the arrangement of turrets any time within six months after the contracts were signed. This loophole was left for two reasons: First, because the board was not unanimous, and perhaps not fully convinced, and, second, because it was expected that the "Kearsarge" and "Kentucky," built with superimposed turrets and not then completed, would by their behavior assist in solving the problem. The Navy Department did not regard the finding of the board as a satisfactory decision and Secretary Long therefore added nine more members, including a naval constructor to represent Chief Constructor Hichborn, who was a member of the Construction Board, but who was absent from Washington. To this board the whole subject was turned over, and although Secretary Long made no suggestions as to what should be done, it was well understood that he desired that a single type should be adopted. The proceedings of the board are highly interesting in view of the end sought to be attained. The first vote taken resulted in 7 to 5, one not voting, in favor of the superimposed turret plan. The second vote was taken upon the proposition to dispense with the two turrets to be placed in the waist, but this was defeated. Although these two votes amounted to the adoption in all its details of the so-called Bradford plan, another vote was taken on a compromise proposition providing for three ships with superimposed 8-inch turrets, and two with the 8-inch turrets quadrilaterally

arranged, the ballot standing 12 to 1 in favor of the compromise, the single negative vote being cast by Naval Constructor Taylor, representing the absent Chief Constructor, who is a strong advocate of the quadrilateral arrangement. The report of the board was laid before Secretary Long last week, and, as above stated, he yesterday approved the compromise, and the five new battle ships will be designed in accordance therewith. Taking into account the "Kearsarge" and "Kentucky," the largest battle ships thus far constructed, the navy will be equipped with seven vessels, five of which will have superimposed 8-inch turrets, while two will be equipped with the small turrets quadrilaterally arranged.

The designers of the Bureau of Construction will at once take up the general plans of the Construction Board and will proceed to work out the details of the five new battle ships in the expectation that they will be ready for advertising early in the fall. The armored cruisers will then be taken up and contracts let about January 1, after which the protected cruisers will be advertised in the hope of contracting for their construction before the end of February.

All the obstacles which have heretofore existed to prevent the letting of contracts for the vessels authorized by the naval appropriation act of 1899 were removed at the last session of Congress, according to the construction put upon the new law by the Navy Department. The provision in the act of 1899 forbidding the Secretary to contract for the hulls of vessels prior to contracting for armor is held by the law officers to have been repealed in effect by the authorization to the Secretary to contract for armor at "a reasonable price." As the armor makers have already agreed to furnish armor at a price at least as low as that at which it is supplied to foreign governments, and as the Department is prepared to contract for 31,000 tons in a lump the officials feel that all question on that score has been disposed of. In addition, the proposals printed in *The Iron Age* last week calling for bids for armor on August 10 will determine the exact situation concerning armor some time before the Department is prepared to submit plans to the shipbuilders.

Secretary Long yesterday announced that the President had selected the names for the eight war ships authorized by the last naval appropriation act, as follows:

Battle Ships—No. 16, "Virginia;" No. 17, "Rhode Island."

Armored Cruisers—No. 7, "Maryland;" No. 8, "Colorado;" No. 9, "South Dakota."

Protected Cruisers—No. 20, "St. Louis;" No. 21, "Milwaukee;" No. 22, "Charleston." W. L. C.

The Welmer Machine Works Company of Lebanon, Pa., have received an order from the Atlantic Iron & Steel Company of New Castle, Pa., for two 50 x 96 x 60 inch blowing engines, also an order from the Republic Iron & Steel Company for their Youngstown, Ohio, furnaces for two blowing engines of the same size as the Atlantic Iron & Steel Company engines. They have also been awarded the contract for Uehling pig iron casting machines from the Warwick Iron & Steel Company, Pottstown, Pa.; Richard Heckscher & Sons Company, Swedeland, Pa., and Joseph Wharton, Port Oram, N. J. They have further received a great many orders for cinder cars, also for their 20-ton hot metal cars to carry iron from the furnace to the casting machines.

The quarterly bulletin of the Bureau of Labor Statistics of New York State, just issued, for the three months ended March 31, 1900, shows a net gain for the quarter of 62 unions and 8152 members among the labor organizations of the State. The increase of organizations has been continuous for several years, and the aggregate membership is now 232,533, which is 30 per cent. larger than it was at the corresponding dates in 1898 and 1899. Since 1897 the number of women belonging to labor organizations has more than doubled. The proportion of trade unionists not at work at the end of March was 20 per cent., as compared with 18.3, 42.0 and 30.6 per cent. at the end of March, 1899, 1898 and 1897, respectively.

It is reported from Anderson, Ind., that the American Window Glass Company will submit to their employees a proposition that the capital stock of the company be increased from \$17,000,000 to \$19,500,000, and that this increase be divided among the employees in the form of preferred stock.

American enterprise is coming to the front in the exploitation of the petroleum fields of Japan. Two experts from the Standard Oil Company have just made a favorable report upon a field in Echigo Province, upon which trial workings are to be made.



# The Iron Age

New York, Thursday, June 28, 1900.

|                         |           |                            |
|-------------------------|-----------|----------------------------|
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| RICHARD R. WILLIAMS,    | - - - - - | HARDWARE EDITOR.           |
| JOHN S. KING,           | - - - - - | BUSINESS MANAGER.          |

## Paternalism and Industrial Development.

We have become accustomed in America to observe among students of economics a pronounced desire to fly from well-known evils at home to methods which apparently work well abroad. Government reports, the essays for doctors' degrees, the elaborate treatises of our professors of economics, the writings of reformers and of journalists on the wing, all breathe an admiration for the well regulated systems in vogue in Europe. From the model municipal plants for supplying gas and electricity to the great government systems of railroads, from the village poorhouse to the vast machinery for the care of the injured and the maintenance of the invalid workmen, all are held up to us for admiration and adoption. Under the pleasing guise of elaborate, carefully regulated, enormous institutions, there is a pronounced drift toward socialism which is in marked and, let us hope, irreconcilable antagonism to the spirit of our own institutions. Let it be admitted at once that very much which is very attractive is revealed by even a superficial study of European institutions.

With us the constant appeal to public opinion as the final arbiter spreads before the world, often in an exaggerated form, the details of abuses, while the compact bureaucracy of Continental Europe, animated by a strong *esprit du corps*, resists criticism and defeats changes. Americans often display a callousness to abuses which is shocking to Europeans, who do not understand our sanguine temperament, and cannot share our confidence that there must be a steady improvement. They are apt to seek behind revelations undiscovered evidence of a far more serious character, and feel convinced that defective methods must prove that the underlying principles are vicious and dangerous. At a distance, to them the concentration of power seems far more advanced than it really is. They see in us a nation of multi-millionaires and of paupers. They believe the former to be the ruling class, with no sense of responsibility, intent only upon piling up additional millions. They do not realize how high the standard of living is with the great mass of our workers, nor what hopes of success, fostered by an endless number of examples in every walk of life, stimulate the ambition and shape the destiny of the average American citizen. At every step in Europe one is struck with the fact that the ruling class, through the State, is impressed with the necessity of taking care of the masses, and with the reliance of the latter upon the State to guard their welfare and promote their interests. On the one side there is a high sense of responsibility; on the other a dependence, which, however, is being shaken more and more by a growing feeling of political power.

Those who hold the reins point with justifiable pride to the admirable character of the administration, its efficiency, and its purity, and rely upon the telling and final argument of success. The others accept as correct the underlying cardinal principle, but urge that its application is far from being carried to the lengths to which

it should go for the good of the great majority. It resolves itself into the question whether the best results are to be obtained by placing the power into the hands of a few, possibly better equipped to wield it, or by admitting all to a share of the responsibility. If paternalism is good, then let all be fathers.

The tendency to place the State in control of affairs is evidenced in the nationalization of the railroads, of the telegraph and the telephone, of savings banks, of workmen's insurance against accidents, and in laws to provide for the old age of workmen. In the labor laws the State intervenes between the two contracting parties and compels both to assume certain financial obligations for the good of the workmen. The whole legislation, beautifully elaborated though it be, is based upon the conviction that the workman is not able to take care of himself. He is improvident. Therefore a certain sum per month must be withheld from his wages in order to accumulate a fund for his old age. All must contribute at regular intervals in order that the unfortunate stricken by accident shall be taken care of during sickness and recovery. These contributions are compulsory. The individual has no voice in determining their amount, nor in their administration.

The whole proceeding is based upon the conviction that the individual workman needs some one to play Providence for him, and that there is no hope that he ever will be able to stand on his own feet. That self reliance which comes from the constant exercise of a man's power to shape his own affairs, which is the most desirable of all qualities in the man and in the citizen, is sapped at the outstart. In Europe there seems to be little conception of the fact that the measures forced through in the name of humanity mark the first step in the demoralization of the individual; that they create a nation of subjects rather than of citizens; that the labor laws, which apparently have been generally assented to, establish the right, on the part of the State, to withhold from the wage earner a part of his remuneration for work, for a specific purpose, not general in its character, but for class uses. In other words, the State, assuming that a group of its citizens must be taken care of, forces them, to abdicate their own functions, and surrenders even a part of its own. If a man is injured when at work, it does not rest with the courts to decide the responsibility for the injury done and to determine the damages, but a labor department, a special organization, intervenes. The State settles how much a workman must set aside from his earnings to provide for his old age. All the pleas for humanity, all the claims that these funds are admirably administered, cannot shake the feeling that such a system is repugnant to the whole spirit of American institutions, and that, in the long run, it must react disastrously upon the character of the working population upon which it is imposed.

Observant Americans visiting Europe are struck with the fact that all is not lovely in another direction which has a bearing upon industrial development of some foreign countries, and that is in the nationalization of railways, which is often held up to us as the goal ardently to be desired. It may be claimed that when a country has pretty well completed its network of railroads a State administration has advantages over private management. During the development stage the former would be utterly inadequate. Imagine a State bureau at Washington determining in what parts of the country new lines are most needed and most likely to be remunerative. But even in Germany, which is well equipped, the permission to build private secondary lines, granted some years since, has been followed by a rush of new work, thus

showing that the State did not keep up with the requirements of the country.

Aroused largely by the reports of what was being done in the United States in lowering the cost of hauling freight and in cutting down rates, the captains of industry in Germany realize that State administration of railroads has its very serious disadvantages. Their experience should warn us not to fly too hastily from admittedly great evils to even greater dangers.

When the nationalization of the railroads of Prussia was advocated and carried through, the pledge was virtually made in behalf of the Government that the net earnings of the lines would be applied to an improvement in the service and to a lowering in rates. Those pledges, it is asserted, were never kept. As a matter of fact, large sums earned by the railroads are used for general purposes, so that the appropriations called for to meet the requirements of other branches can be made much smaller than the expenditures really are. That such a system bears heavily upon those industries, like the coal and iron trades, in which the cost of assembling by rail plays so important a part, will be readily understood. The desire on the part of the railroad officials to make a good showing of course creates a resistance to a lowering of rates, which becomes formidable when backed by almost unlimited power of rate making.

The whole machinery is exceedingly cumbersome and possesses an extraordinary inertia. The smallest details must work their way through the hands of innumerable officials up to headquarters, and plow their way back. The responsibility of individual officials is strictly limited, and naturally few dare even approach the limit. Important matters are subject to negotiations, protracted over years, by investigations, reports, reviews, &c., until the emergency has long passed. In some cases, when a quick answer is imperative, notably in making rates for export, rapid decisions are made. Instances were cited in which telegraphic decisions have come from Berlin on the day of application by wire.

Americans are further struck when traveling through the country with the fact that many apparently large manufacturing plants did not have any sidings into them from the railroad lines. Inquiry revealed the fact that often the building of a siding from the Government roads is a very formidable undertaking, and that sometimes years elapse until the connection is finally made, if it be granted at all.

Large shippers in Germany are not all ardent admirers of the wonderful stations which are being erected in nearly all the great cities. They insist that too much money is being spent on them, and that the passenger service, which appeals to the great mass of the people, is favored at the expense of the freight branch, which after all earns much more.

They claim that the management is not as alert as it would be if the men in charge were engaged in private service instead of being members for life or good behavior of a huge bureaucracy. They insist that they are slow in adopting technical improvements, in substituting modern for antiquated appliances, that they are officials rather than business men, and that the industries of the country suffer from that fact. Pushing and enterprising as the German manufacturers are, they fret under the toil of making the ponderous State railroad administration machinery depart from its accustomed gait.

So much must be said for the Prussian and German State railroad management, however, and that is that not a breath of suspicion is raised against its integrity, and its honesty of purpose. One never hears of discrimination of rates, nor of collusion between shippers and

railroad officials in any form. In that respect the management is ideal, and yet it is a very grave question whether, in a struggle for foreign markets, other things being equal, our system of private owned roads, with their quick adaptation to circumstances and their instant and effective action in emergencies, does not give us advantages, whether our rapid technical progress in equipment, due to a keen competition, will not keep us ahead of rivals who must write long petitions to Government officers.

### The British Demand for American Goods.

We have received the following interesting letter from Charles Churchill, managing director of Charles Churchill & Co., Limited, London, England:

The long residence of the writer in this country and the close connection that we have had with the introduction of American machinery here have given us very extended connections and acquaintances. We therefore feel that we are able to gauge pretty correctly the future tendency of its trade. England has never been quick to take up American lines and introduce them into their various workshops. Our Continental friends have been much more rapid in this respect, but at the same time there has been a steadily growing demand for American tools, and the prejudices which existed 20 years ago have been very largely dispelled, and are continually growing less and less.

One serious obstacle here has been the objection of the men connected with the trades unions, which have kept down the output of machines and thus prevented the development of the practical abilities of the tools. That is slowly wearing away, and workmen are beginning to realize in many places that it is to their interest to make most of these improved tools. We think that in the course of time this difficulty will gradually disappear. Where new works are being erected many new tools are being put in of American manufacture, and this has led many of the older manufacturers to try the experiment of putting some into their works, and the wedges that have thus been driven are opening up a way for further tools.

With the exception of the year when the bicycle business was boomed here there has not been any great boom in general engineering tools, but there has been a steadily increasing demand, and it appears to us at the present time that the demand will continue. There are thousands of workshops that have tools that should be replaced by more modern ones, and the knowledge of this is gradually being realized. All our places look for a steady trade in the sale of our American machines, and we believe the trade will continue here when it will have dropped off very largely on the Continent.

In the matter of smaller tools and supplies, where 20 years ago these could not be found in the retail places, they are now generally carried in small assortment and the workmen are realizing the advantages combined with low prices of these more modern tools. The same remarks which we have made on the heavier machinery apply to some extent in the smaller tools, and we are confident that this will continue to be a good and growing market for our American manufacturers.

Many of our American manufacturers are still deficient in the knowledge of packing machinery properly. Many of the tools that we receive come insecurely fastened in the cases, and occasionally have broken parts. Our American manufacturers have yet to learn that machinery packed for export abroad should be so firmly secured in the case that it will ride in safety in any position, as cases are frequently packed in the steamers bottom side up, or lying on their sides. Until they realize this more fully and guard against this condition of things we shall continue to receive broken machinery. It is not from lack of material, but from lack of knowledge in so using the material as to secure this safety. Some of our firms have reached the full knowledge, and every machine comes out perfect. We believe that some of our American friends who have been unpacking and setting up their own machines in the Paris Exposition the last few weeks are going back to America sadder and wiser men, and they will realize the necessity of paying a little more attention to this branch of their business.

You will realize that in having our branches in the various parts of Great Britain we are able to supply the local needs much more promptly and to better advantage than working from the one place only, and we believe that our customers will fully recognize this fact and appreciating it will favor us with a goodly portion of their orders. At the present time the high prices of tools somewhat retard their sale, but it appears to us from



all that we can see that the top scale has been reached and the near future will see the prices at a lower point. We do not care to see them come down to the lowest figure at which they were formerly sold, but we believe a little reduction would be to the mutual advantage of both buyer and seller.

### Labor Legislation in New Zealand.

Following is a statement of the leading features of the New Zealand labor law, to which editorial reference was made last week:

The New Zealand law was framed after a careful study of local conditions, by Hon. William Pember Reeves, the Colonial Minister of Labor. It was vigorously opposed, and was passed with no little difficulty, the opposition having what appeared to be the best of the argument, but finally yielding to Mr. Reeves' plea that the experiment, whatever the results attending it, could not change for the worse the conditions it was designed to correct. Since then it has been necessary to amend it in many ways and considerably extend its scope, and it is extremely significant that this supplementary legislation, though on the lines and in enlargement of the purposes of the original law, has passed almost without dissenting votes. With one insignificant exception there has not been in four years a strike or lock out in New Zealand.

It is scarcely practicable within the limits of an editorial article to more than outline the conciliation and arbitration system of New Zealand. It is applicable only to industries having registered trade unions. This is to guard the court against being overwhelmed by petty and individual disputes; but that it shall not work hardship to any class of wage earners, the law provides that any seven men following a common occupation may organize a trade union and register it, thus giving the members a standing under the act. The machinery of arbitration is set in motion only when appeal is taken by one of the parties to a dispute which cannot be adjusted in any other way. There are two classes of tribunals—boards of conciliation and a court of arbitration—in both of which employers and employees are equally represented by men of their own choice. Every industrial district has a Board of Conciliation, and as many districts are created as the Governor-General deems necessary. There is but one Court of Arbitration. The Boards of Conciliation have each from four to six members, who are chosen for three years. The function of these boards is to consider such questions of difference as are referred to them, and to adjust them if possible. A great majority of the labor disputes are thus disposed of, although the decisions of the boards are not in any way binding. The Court of Arbitration consists of three members, who are appointed by the Governor-General and hold office for three years. One is selected from among the nominees presented by the employers, and one from among the nominees offered by the unions. The Governor-General is restricted to selections from the eligible lists thus furnished him. The third member of the court is the Colonial Chief Justice, who presides. This court only hears and decides contentions brought before it on appeal from the Boards of Conciliation, such appeals usually being taken by the parties which have established their contentions, to the end that the decisions of the boards, if confirmed, may be made binding. This is one of the anomalies of the law, and invites the only amendment now deemed necessary—one making the decisions of the boards binding, but granting appeal to the party which deems itself to have been defeated, to the end that any error in the rulings of the boards may be reversed or modified by the court of ultimate jurisdiction.

The practical working of the law may be indicated in a few words. A dispute arises in a factory and becomes an issue between the workmen's union and the employers' association. Either side may take it before the district Board of Conciliation, where it is fully discussed. The board has power to summon witnesses and call for books and papers. It presents a basis of settlement, and as the rule its advice is accepted, which ends the incident. The dissatisfied party may take the case on appeal to the Court of Arbitration. This, like a suit at law, obligates both parties. The refusal of either to appear before the court and plead would only result in a judgment on the evidence presented, and if the party refraining from participation in the appeal refused to conform to such judgment he would quickly find himself in serious trouble. From the moment a dispute is taken before the district board any strike or lock out is a violation of law, and exposes those responsible for it to such penalties in fines or imprisonment as the court may see fit to impose within the statutory limits. The law also forbids and makes punishable strikes or lock outs to forestall arbitration. A decision of the court settles the question at issue for two years, unless a shorter pe-

riod is specified by it. The power of the court to punish those adjudged in contempt is largely discretionary, and has been used discreetly, but in such manner as to discourage any trifling with its authority. The net results are that labor is more generally and satisfactorily employed than ever before; that new factories are building and old factories extending; that capital and labor are better satisfied than they were under the old system; that more confidence is felt in industrial investments in the colony than could exist if manufacturing was liable to the constant and costly interruptions of strikes and lock outs, and that shopkeepers who deal with the working classes admit that business is better and bad debts fewer than at any time within 20 years.

### Sheet Conference Last Week.

Last week more conferences were held in Pittsburgh between committees representing the American Sheet Steel Company and the Amalgamated Association. When the scale governing sheet mills was adopted at the conference of the Amalgamated Association in Indianapolis, in May, the men asked for an advance ranging from 10 to 12 per cent., but far more important than this was the demand made in the new scale that all mills owned by the American Sheet Steel Company should sign the scale and be governed by the rules of the Amalgamated Association. The officials of the American Sheet Steel Company have strenuously objected to this, and this demand has so far prevented a settlement of the scale.

As far as the wage based on the scale is concerned, this could have been arranged very quickly, but the officials of the American Sheet Steel Company absolutely refused to sign the scale for the sheet mills which have heretofore been operated as non-union. Among these are Wellsville Plate & Sheet Company, Wellsville, Ohio; Scottdale Iron & Steel Company, Scottdale, Pa.; W. Dewees Wood Company, McKeesport, Pa., and Apollo Iron & Steel Company, Vandergrift, Pa.

It is claimed that nearly one-half of the number of mills owned by the American Sheet Steel Company have been operated non-union, and will continue in that way. Just now it does not look as though a settlement of the sheet scale would be reached before July 1, and if this is the case, all the sheet mills, with the exception of a few independent concerns, will be closed on June 30. It is probable that a shut down of the sheet mills for two weeks, or better still, for a month, would cause a considerable improvement in the sheet trade, as it would result in stocks being cleaned up and put the market on a much better basis.

### Witherbee, Sherman & Co. Incorporated.

The firm of Witherbee, Sherman & Co. have been incorporated under the same name as a stock company under the laws of New York with a capital of \$3,000,000, all in common stock. The company propose to mine and sell iron and other ores and minerals, to smelt and manufacture the same and to sell the products. The principal office will be in the town of Moriah, Essex County. The directors and principal shareholders are Walter C. Witherbee and Frank S. Witherbee of Port Henry and George D. Sherman of Crown Point, each of whom agree to take \$250,000 stock in the company; Wallace T. Foote, Jr., of Port Henry, \$500,000, and Lewis W. Francis and John R. Sherman of Port Henry, each \$1000.

The new company will take over the entire real estate and personal property of the firm, including the Cedar Point Furnace. Some time ago, it will be recalled, a plan was projected for the consolidation of the Witherbee-Sherman properties with other iron and steel concerns of the State into a \$17,000,000 company. A representative of the new company states that the incorporation has no connection whatever with any such deal nor is it looking forward to any consolidation. The whole significance of the incorporation is in the change from a copartnership to a chartered company. The change had been desired for several years by some members of the firm, but it was only recently that all would agree to it.

The new company will be essentially a producer of iron ore, though they may also make some pig iron. The present capacity of the mines is about 600 tons per day.

The steamer "Simon J. Murphy," the first of two steel freight vessels being built by the Detroit Shipbuilding Company of Detroit, Mich., for Eddy Brothers & Co. of Bay City, was launched at the Wyandotte yards on Saturday. She is 451 feet long, 51 feet beam and with molded depth of 28 feet. The engines of the "Murphy" are of the triple expansion, vertical inverted type, with a capacity of 1500 horse-power.

## OBITUARY.

EDWARD N. PAGE.

Edward Noah Page of the firm of Morrison, Colwell & Page, proprietors of the rolling mill at Cohoes, N. Y., died on June 19 at Asbury Park, N. J., at the age of 75 years. He was born in Staffordshire, England, and came to the United States in 1845. After serving some years as a roller in rolling mills in Boston, Mass., and Pembroke, Maine, Mr. Page went to Troy, N. Y., and became superintendent in the Burden Iron Works. Thirty-eight years ago he removed to Cohoes and started in the rolling mill business, in partnership with Jonas Simmons. Subsequently he bought out Mr. Simmons' interest and entered the firm of Morrison, Colwell & Page. Mr. Page recently retired from the presidency of the Page-Hershey Iron & Tube Company of St. Henri, Montreal, Canada. He is survived by two sons and four daughters.

DR. HERMAN S. LUCAS.

Dr. Herman S. Lucas, formerly president of the Hampden Emery & Corundum Company of Chester, Mass., died on June 20 at Franklin, N. C., at the advanced age of 83 years. He was born at Blandford, Mass., and taking up the study of medicine, was graduated as a physician in 1842. For two years Dr. Lucas practiced in Pittsfield, and subsequently removed to Chester, where he continued his medical work until 1878. In 1856 he discovered what for some time was supposed to be a large deposit of iron in the mountains around Chester, and arrangements were made for the opening and working of the mine. During the following year some 1200 tons of the mineral was taken out and shipped to the furnaces at Stockbridge and Lenox, and to Hudson, N. Y. The financial crisis of 1857 compelled the doctor to discontinue the working of the mine until 1863, when, in company with his brother, John E. Lucas, and Henry D. Wilcox, he reopened it. A blast furnace and forge were erected at Chester, and the manufacture of iron was commenced. The result was far from satisfactory, as the ore proved intractable. After making a more thorough examination of the mineral the doctor discovered on September 6, 1864, that it contained a large percentage of emery. This mineral had been hitherto unknown in the United States. In 1868 Dr. Lucas, with Charles Alden and H. D. Wilcox, formed the company known as the Hampden Emery Company, and on May 18, the following year, the doctor purchased the interest of his partners and continued the business until 1874, when questions arose involving the doctor in litigation, which caused the suspension of the manufacture of Chester emery by him. He continued in business, however, obtaining his material from Turkish mines, until May 1, 1878, when Nathan A. Harwood became associated with him. Mr. Harwood succeeded in devising a new process for the better division of the minerals and the general improvement of the grading. After having accomplished this he commenced a systematic study of the mountains around Chester, opening up new mines with a business enterprise that soon placed his company upon a solid financial basis. In the year 1888 a stock company were formed, and Dr. Lucas was chosen president and Nathan A. Harwood treasurer and manager. Since 1878 the doctor spent most of his time in the South. A number of corundum mines have been opened by him in North and South Carolina, and have been purchased by the Hampden Emery & Corundum Company, who control all the emery and corundum found in paying quantities in the United States. The entire value of the company's plant is estimated at \$2,000,000.

EMILE C. GEYELIN.

After a brief illness, Emile C. Geyelin, widely known as a civil engineer and as the builder of turbines at Niagara Falls, died June 25 at his home, in Philadelphia, at the age of 75 years. He came of an old Huguenot family, which for a long term of years had held the office of burgomaster in his native city of Mullhouse, France. He studied at the Ecole Centrale, a French engineering school, and received a thorough mechanical training in the great iron works of Andre Koechlin & Co. In the latter part of 1848, after having still further advanced himself in his studies, by visiting industrial works in the north of France, Belgium, England and Scotland, he came over to Philadelphia. Through the friendly attention of Isaac P. Morris, Mr. Geyelin presented the merits of the Jonval turbine, then a new device, to E. J. DuPont & Co., who adopted these motors to advantage in their extensive powder works, and caused them to become better known in this country. In 1850 similar turbines were installed in the Fairmount Water Works of Philadelphia. Mr. Geyelin subsequently became a consulting engineer with the late Richard Wood of R. D. Wood & Co. Mr. Geyelin was the builder of a large number of turbines for municipal water works, includ-

ing Manchester, N. H.; Augusta, Maine; Montreal, Canada, and in the South and West. In later years he installed the turbines at Niagara.

GEORGE FERGUSON.

George Ferguson, proprietor of one of the largest retail hardware stores in Westchester County, died at New Rochelle, N. Y., on Friday, June 22, from apoplexy, aged 68 years. Mr. Ferguson had been in business in New Rochelle for nearly 50 years, and had built up a large and successful establishment. He was vice-president of the Bank of New Rochelle, an enterprising citizen and highly esteemed by the entire community.

EDWARD M. TRUMP.

Edward M. Trump, son of Augustus Trump, secretary and treasurer of the Pittsburgh Steel Foundry, died at the residence of his father in Pittsburgh last week. Mr. Trump was 24 years old, and had been identified with the Pittsburgh Steel Foundry for several years.

## PERSONAL.

D. K. Nicholson of the Edgar Thomson Steel Works, Bessemer, Pa., had the degree of master of science conferred on him by the Lehigh University on June 20 in recognition of his attainments in geology.

C. W. Bryan, formerly chief engineer of the Edgemoor Bridge Works, at Wilmington, Del., has been put in charge of the railroad work for the Pittsburgh district of the American Bridge Company. His headquarters are in the Metropolitan Bank Building, Pittsburgh, Pa.

Jos. W. Bramwell, formerly engineer and manager of Riehle Bros. Testing Machine Company, and editor of the *Digest of Physical Tests*, is now associated with the Philadelphia Machine Tool Company as engineer. He will there personally supervise the manufacture of testing machinery in all its departments, introducing many new and important features which he has developed by close and careful observations of the requirements for accurate work.

K. Okazaki of Tokio, Japan, who represents the largest machinery importing house in that country, is in Pittsburgh buying a large amount of iron pipe and oil well machinery for use in the development of the Japanese oil fields.

J. B. Clyne, mechanical engineer for the Cleveland Machine Screw Company, Cleveland, Ohio, sailed for Europe last Saturday. He will transact business in London, Manchester and Paris, after which he will enjoy an extended vacation at his old home, near Peterhead, Aberdeenshire.

O. H. Tittmann will succeed to the presidency of the United States Coast and Geodetic Survey, filling the vacancy caused by the election of Dr. H. S. Pritchett to the presidency of the Massachusetts Institute of Technology.

W. D. Sargent, general manager of the Sargent Company, Chicago, returned from Europe Saturday last, the 23d, after a two months' trip.

The resignations of A. M. Crane, assistant to the chairman, and C. T. Boynton, general sales agent, of the American Steel & Wire Company, at Chicago, are announced. These offices have been temporarily filled by the appointment of E. C. Lott to succeed Mr. Crane, and Frank Baackes to succeed Mr. Boynton. It is expected that these appointments will be made permanent by the Board of Directors at their next regular meeting.

## The Hartman Casting Machine.

The pig iron casting machine built for the Thomas Iron Company, at Hellertown, Pa., by the Hartman Company of 1231 to 1239 North Front street, Philadelphia, was put in successful operation on the 23d inst.

The molds are carried on the ends of radial shafts placed around a circular iron table, each one working separately and independently. The molds are coated with pulverized coal and coke, and the metal poured directly on the coating. As soon as the mold is poured it enters a trough of water, three-quarters the height of the mold, and the top is chilled with a spray of water. After passing through this trough for a certain distance it enters another, in which it is entirely submerged and cooled for shipping.

The pigs are carried around in the molds to a conveyor, upon which they are automatically dumped and then conveyed on board cars ready for shipping.

This machine is capable of taking care of 500 tons of iron per day, and only requires four men, which includes the man operating the ladle and the one looking after the distribution of pigs on board the car.



## Trade Publications.

**Lathes, Tool Grinders.**—The Gisholt Machine Company of Madison, Wis., have prepared a splendidly illustrated catalogue of the well-known Gisholt lathes and universal tool grinders. Several views are devoted to their new factory, which has just been completed and which has been arranged specially for the manufacture of these machines. The first five engravings show their standard type of turret machines, which will swing 13, 21, 24, 28 and 34 inches. These are of exactly the same design and embody the best known devices for the rapid and accurate production of work. These tools will produce several times as much work as an engine lathe, while the quality of the work is much more uniform. Many views are furnished which show these machines fitted with the necessary special tools for manufacturing different pieces.

**Inspirators.**—The Hancock Inspirator Company, 85 Liberty street, New York, have issued a new catalogue of 40 pages devoted to the well-known Hancock inspirators, of which they are the sole manufacturers, for stationary, marine and portable boilers. All the various types of these inspirators are illustrated and described in detail, and much additional data of value are furnished in directions for connecting and operating, together with price-lists, which latter it has been found necessary to revise owing to the introduction of new goods. The book also shows the ejectors, injectors, hydrocarbon burners, Hancock shaking grate, valves and general jet apparatus, which the company make.

**Machine Tools, Small Tools, Standards and Gauges.**—We have received from the Pratt & Whitney Company of Hartford, Conn., catalogues dealing with their machine tools, small tools and standards and gauges. This company were organized in 1869, and now occupy considerable space on both sides of the Park River and along the tracks of the New York, New Haven & Hartford Railroad. Some idea of the extent of the plant may be had from the statement that in the main shops there are 504 lathes of various kinds, 135 planers and shapers, 181 milling machines, 132 drilling, boring and tapping machines, 62 hand and automatic screw machines, 26 gear and rack cutting machines, 24 relieving, chasing and threading machines, 118 grinding machines, 10 printing machines and 147 miscellaneous machines. When these are all running the company give employment to 1300 persons. Power is provided for operating the works by seven steam engines aggregating 424 horse-power and 11 electric motors of 188 horse-power. The machines described include lathes, boring mills, planers, drilling machines, milling machines, gear cutters, roll grooving machines, die sinking machines, grinders, screw machines, bolt cutters, &c., all being made in many different patterns. Their small tool catalogue describes their taps and dies, milling cutters, drills, punches, &c. The gauge department deals with standard gauges, ring and plug gauges, caliper gauges, standard reamers, standard measuring machines, &c. Their standard measuring machine is an instrument of precision for originating gauge sizes or for duplicating existing standards. This machine fully covers the requirements for purposes of accuracy within limits which are necessary and entirely practicable for this class of work.

**Superheated Water for Power.**—The Storage Power Company, 30 Broad street, New York, have issued a circular describing their method of using superheated water for power purposes.

**Slotting Machines.**—A pamphlet from the Betts Machine Company, Wilmington, Del., describes their improved slotting machines, made in sizes from 8 to 24 inches. The cutting bar of their 15-inch machine has eight speeds, is counterbalanced and returns 3 to 1. It is furnished with a vertically adjusted gauge. The distance from the frame to the front side of the cutting bar is 30 inches, making it possible to slot in the center of 63 inches. The distance from the table to the under side of the frame is 22½ inches. The feeds are positive, self acting in all directions and operate at the upper end of the stroke. The compound tables have an adjustment of 38 inches longitudinally, 30 inches transversely, and support a revolving table 33 inches in diameter, which is secured in any position by corner clamps.

**Metal Sawing Machines and Pneumatic Tools.**—The Q & C Company of Chicago have prepared two catalogues treating of their cold metal sawing machinery and pneumatic tools. Their Bryant sawing machine No.

10 is designed for cutting off iron or steel bars, risers from small castings or structural iron work, and has a capacity up to 5 inches in diameter in bars and risers, or 5 x 12 inches in solids. The pneumatic tools consist of hammers, drills, riveters of many different types, stone hammers, flue expanders, &c.

**Water Softening and Purifying.**—We have received from the Industrial Water Company, 15 Wall street, New York, a pamphlet describing their method of water softening and purifying. This is accomplished by means of chemical precipitation and settling.

**Belt Conveyors.**—A very complete description, together with views illustrating their wide application, is presented in a catalogue of their belt conveyors by the Robins Conveying Belt Company of New York. Briefly described this conveyor is a moving trough. Its fundamental principle is the perfect separation of the conveying parts from the running parts. The material is received directly on the troughed belt and carried at a minimum of friction to its destination. There is none of the jamming and clogging so noticeable in the operation of the scraping systems, nor are there any joints, bolts or other projections.

## Scale Conference at Detroit.

Last week arrangements were perfected by which a conference between the Bureau of Labor of the Republic Iron & Steel Company, James H. Nutt in charge, and the Wage Committee of the Amalgamated Association of Iron, Steel and Tin Workers was held in Detroit, Mich., on Monday, June 25, in an effort to arrange a bar scale for puddling and bar iron mills for the year commencing July 1. The average increase demanded by the workers in the new scale is about 10 per cent. advance over the present scale.

However, in view of the rapidly falling market, it is not believed this advance will be granted, but that a settlement will be reached on the basis of the present scale. The scale is based on the average price of actual sales of bar iron, the average price for two months fixing the wages for the succeeding two months. The rate for puddling asked in the new scale is \$5.50 a ton, based on the price of bar iron at 15-10 cents a pound, and this rate is minimum. Should the price of bar iron go to 1 cent or lower the price of puddling would still be \$5.50 per ton and other labor in proportion. The American Steel Hoop Company, who are large makers of iron and steel bars, will be represented at the conference by Thomas Parrock, who is superintendent of the Union Works of the American Steel Hoop Company, located at Youngstown, Ohio.

**Slaymaker-Barry Company.**—The Slaymaker-Barry Company, who have been operating at South Connellsville, Pa., for some years, will shortly change their firm name to Baldwin Automobile Mfg. Company. S. R. Slaymaker, formerly president of Slaymaker-Barry Company, but who resigned his position recently, has removed to Lancaster, Pa., where he will continue the business of Slaymaker-Barry Company in the manufacture of locks and hardware. The works at South Connellsville will be operated by the Baldwin Automobile Mfg. Company in the manufacture of automobiles. It is said that 150 men are now employed, and this force is being increased almost daily. It is expected to turn out the first machines about July 1, and the concern are reported to have on their books orders for a large number of automobiles.

Some of the Western papers have published the false report that the tube mills at Findlay, Ohio, owned by the Heckert-Baltzley Billet Company of Toledo, Ohio, have been closed down, because the company were losing money by their operation. The company officially advise us that the suspension of operations is but temporary, and is for the purpose of installing their new universal mill, which has been in course of construction, and has now arrived and is being erected. The new equipment is expected to be greatly superior to the present one, and will therefore put the company in very much better shape to handle future business.

A Vienna (Austria) manufacturer has placed an order with the W. J. Clark Company of Salem, Ohio, for a supply of the American style of steel tote boxes, introduced by that company about ten years ago, and now in use in many shops and factories in this country in which wooden boxes were previously used. Steel boxes are found to be more economical than wooden ones, though they cost twice as much at first. They not only outlast wooden ones, but are more convenient to handle and reduce the fire risk, facts which have attracted the attention of manufacturers abroad.

## MANUFACTURING.

### Iron and Steel.

The Lower Union Mills of the Carnegie Steel Company, at Pittsburgh, will be closed down in a few days and very extensive repairs and improvements made. A large amount of new equipment is to be added at this plant and its capacity very greatly increased. The principal product is car axles and heavy forgings.

The American Nickel Steel Company have been incorporated at Wilmington, Del., with a capital of \$1,500,000, by J. Marvel, W. M. Lupton and R. C. Lupton, all of Wilmington.

The affairs of Laughlin & Co., Limited, formerly operating the Eliza furnaces in Pittsburgh, are to be wound up, and Geo. M. Laughlin, James Laughlin, Jr., and W. L. Jones have been appointed liquidating trustees. It will be recalled that Laughlin & Co., Limited, were taken over some time since by Jones & Laughlins, Limited.

The New Castle Shovel Company, New Castle, Pa., who recently sold out their shovel business, have changed their name to the New Castle Steel Company. The concern are putting up a plant for the manufacture of hoops, bands and cotton ties.

A notice has been posted at the Pencoyd Iron Works, owned by the American Bridge Company, to the effect that after July 1 the working hours in that establishment will be reduced from 60 to 57 hours per week, and that all men working by the hour will stop work at 2 o'clock Saturdays. After January 1 the hours will be reduced to 54 per week.

The Sharon Tin Plate Company, who are erecting a ten-mill tin plate plant in connection with the new open hearth steel works of the Sharon Steel Company, at Sharon, Pa., have placed an order with the Sharon Boiler Company, at Sharon, Pa., for about 1500 horse-power Wheeler vertical water tube boilers.

The Washburn Wire Company of Worcester, Mass., have purchased a tract of land at Portsmouth Grove, R. I., as a site for a large plant to be erected there in the near future.

### Machinery.

The Beloit Iron Works, Beloit, Wis., have just shipped 14 carloads of paper machinery, consisting of two paper machines for making tissue paper, to China. Each machine is 100 feet long and will make a sheet of paper 95 inches wide. Although there are a number of paper mills equipped with American machinery in Japan, this is said to be for the first one to be put up in China. The company are composed of Japanese capitalists.

The Century Machine Mfg. Company have just started a plant at Mansfield, Ohio, for building mill, furnace and special machinery. W. C. Lloyd is president.

The Buffalo Forge Company, Buffalo, N. Y., manufacturers of the Buffalo fan system of heating, ventilating, drying and cooling, together with forges, blowers, exhausters and engines, have just published letters received from the Kitson Machine Company, Lowell, Mass.; the Verity Plow Company, Brantford, Ontario; the New York Reformatory, Elmira, N. Y., and the Peoria & Pekin Union Railway Company, Peoria, Ill., highly commending the down draft forge shop equipment installed by the first named company in their several works. The various concerns referred to use the most eulogistic terms in speaking of the merits of the forges furnished by the Buffalo Company.

The Ellwood Iron Works, Anderson, Ind., have been incorporated, with a capital of \$50,000, to manufacture machinery, by W. T. Durbin, W. N. Durbin, J. L. Kligore and W. C. Venne-man.

The Carlin Locomotive Works have been organized at Pittsburgh, with a capital of \$150,000, and have applied for a charter. The stockholders are W. J. Carlin, Loren H. Turner, Wm. C. Scott, Thomas McBride and James S. Braden. The company are erecting a steel building, 175 x 200 feet, on Twenty-fifth street, which will be equipped with machinery for the manufacture of light locomotives, and the concern expect to turn out about two each week. W. J. Carlin, who will be president of the Carlin Locomotive Works, is also president and treasurer of the Thomas Carlin's Sons Company of Allegheny, Pa. Wm. C. Scott, who will be secretary, occupies a similar position with Thomas Carlin's Sons Company. The new company have a number of orders for locomotives and expect to secure sufficient business to keep the new works in steady operation. Thomas Carlin's Sons Company are building a very large addition to their foundry on River avenue, Allegheny, Pa. It will be contained in a steel frame building which is almost completed.

The Richard Mfg. Company, Bloomsburg, Pa., have been kept busy from the first of the year manufacturing special machinery to order, and have work on hand that will keep them employed for the next four months.

The International Power Company of New Jersey, operating the Rhode Island Locomotive Works, Providence, R. I., have just completed an order of five 10-wheel passenger locomotives for the Boston & Maine Railroad. The company are enjoying an unusual prosperity. They are now engaged on several large

orders for locomotives from some of the leading railroads in this country and abroad.

The Providence Engineering Works, Providence, R. I., are running overtime in the effort to complete the old orders on hand in order to make room for the many new ones which the company have secured. The improved Greene engines manufactured by this concern are growing more in favor each year.

The B. & H. Electric Construction & Supply Company, Providence, R. I., have recently taken out a charter under the laws of Maine, with an authorized capital stock of \$30,000.

The Rhode Island Braiding-Machine Company, Providence, R. I., have to work night and day to keep pace with their rapidly accumulating orders.

The Cranston Mfg. Company of Providence, R. I., were incorporated in Dover, Del., June 25, with a capital stock of \$1,000,000, to manufacture machinery of all kinds.

### Hardware.

Atha Tool Company, Newark, N. J., are building an addition to their plant, 40 x 25 feet, three stories, with a two-story extension 30 x 21 feet.

The Easy Spring Hinge Company, Shelby, Ohio, have increased their capital stock from \$50,000 to \$60,000.

Richmond Mfg. Company, Richmond, Ind., have been incorporated, with a capital stock of \$100,000, by W. A. Miles, M. T. Gleeson and E. E. Perry, all of that city. The company will manufacture a line of hardware.

In view of their rapidly growing business Coldwell Lawn Mower Company, Newburg, N. Y., will enlarge their plant by an addition, 70 x 120 feet, two stories high.

Huntsville Handle Mfg. Company, Huntsville, Mo., have recently been incorporated, with a capital stock of \$8000. They will manufacture axe handles.

Scovill Mfg. Company, Waterbury, Conn., are about to award a contract for the erection of several additions to their already extensive plant, as follows: A four-story structure, 50 x 249 feet, connected with which will be an annex, 70 x 32 feet, of the same height, and a one-story building, 70 x 217 feet. The structures will be of mill construction, and the roofs will be covered with slag and asphalt.

Geo. H. Bishop & Co., Cincinnati, Ohio, and Lawrenceburg, Ind., have just shipped a large consignment of their hand saws abroad, and the statement is made that an excellent export trade is being done by them in the British Islands, South Africa and Chili, also on the European Continent, including Germany and Belgium, but for a cheaper grade. A large demand for cane knives comes from Cuba and Porto Rico, while trade on the Pacific Coast also keeps up well.

### Miscellaneous.

The Hodge Iron Company, Chicago, Ill., have been incorporated, with a capital of \$100,000, for dealing in iron and its products, by Arthur B. Schaffner, Louis M. Cahn and Isaac S. Rotchild.

The National Brass & Metal Company, Minneapolis, Minn., have been incorporated, with a capital stock of \$100,000, by Henry F. Hodges, J. C. Lobdell and Asa Talcott.

The Pittsburgh Bridge Company have conveyed to the American Bridge Company their property in Pittsburgh for \$85,790. The land fronts 933 feet along the Allegheny Valley Railroad and has a depth of about 250 feet.

The Youngstown works of the American Bridge Company, at Youngstown, Ohio, are doing considerable structural work for the Egyptian Railroad, now being built by the British Government. The order was received from the Brown Hoisting & Conveying Machine Company of Cleveland, Ohio, who are the principal contractors for the work. The report that the plant of the Youngstown Bridge Company, now owned by the American Bridge Company, would be removed from Youngstown to some other location is officially denied.

The Pressed Steel Car Company of Pittsburgh have received an order from the Erie Railroad for 1000 steel cars.

The Sharon Water Company, Sharon, Pa., are extending their lines and making extensive additions to their plant. They have placed orders for considerable new equipment, included in which is a contract for 40,000 feet of 4 to 12 inch pipe, placed with the Massillon Iron & Steel Company, Massillon, Ohio; one for valves with R. D. Wood & Co. of Philadelphia and the third, for 28 fire plugs, with the Ludlow Valve Mfg. Company of Troy, N. Y. Bids are now being received for a 3,000,000-gallon pump, boiler, also filters and filter house, contract for which will probably be placed this week.

The Cleveland Galvanizing Works, Cleveland, Ohio, announce that they are prepared to furnish galvanized castings, both in gray and malleable iron. They can furnish patterns for castings if required. They make a specialty of bright, smooth and slightly work. Their machine shop is fully equipped with the best of tools for general machine work, metal stamping, die making, &c. They are also putting on the market a fine line of lead gaskets in all sizes.



## The Iron and Metal Trades.

It is useless to attempt to disguise the fact that the situation in the Iron trade has been growing worse instead of better. The reductions in price which have thus far been made have not served their purpose in bringing the great body of consumers into the market. They continue to withhold their orders, and it will probably take some definite development of a favorable character to induce the placing of any considerable business. Instead of favorable developments we have had for some time a succession of unfavorable influences. Among these the drought in the Northwest is just now exerting a particularly depressing effect. If conditions in that section were as they should be at this season the great implement manufacturers would undoubtedly have placed orders to cover the material they need in making up implements for next year, while other important consumers having considerable outlets in that direction would have undoubtedly been good buyers of Iron and Steel.

A meeting of leading Iron and Steel makers was held in this city on Tuesday, and while the nominal Pittsburgh prices of \$20 for Bessemer Iron and \$28 for Bessemer Billets were not changed, it is understood that the market is now an open one, and that Pig Iron and Steel are both being offered at much lower prices. The plan of having a fixed price on Pig Iron and Steel and then selling at lower prices is not helping the market, but is hurting it. It is realized that prices on Pig Iron, Steel and Finished Products must get down to a solid basis before business will start up. There is plenty of tonnage in sight, and with prices down to where buyers think it safe to take hold, a great deal of business will undoubtedly be placed. But the reductions to a solid basis should be made quickly so as to end the suspense.

The fact must not be overlooked that a restriction of production is taking place, with the possibility that in a short time the supply of various kinds of material will be found sharply reduced. It is estimated that at least 30 blast furnaces making Foundry Iron have been blown out in the past two months. Southern blast furnaces are being banked because of labor troubles, and fear is expressed that a satisfactory arrangement cannot be made, but that quite a number of furnaces will be compelled to shut down to await a settlement. Ohio and Western Pennsylvania furnaces are also being blown out or banked because of accumulations of stocks which cannot be moved. The failure to agree on the wages schedule for the coming year in Western rolling mills will certainly cause the closing of a considerable number of establishments of this kind after July 1. The effect of low prices in Plates is seen in the stoppage of a large Western Plate mill because of inability to meet present market prices without loss.

Reductions in prices to a point that will induce buying, together with restrictions in production brought about by the causes enumerated, will put a totally different face on the situation.

An important development in the metal market has been the sharp advance in the price of Pig Lead. Two advances have been made during the week aggregating \$10 per ton, presenting a marked contrast to the recent course of prices in this commodity. Spelter also manifests an upward tendency.

## A Comparison of Prices.

At date, one week, one month and one year previous.

### Advances Over the Previous Month in Heavy Type. Declines in Italics.

|                                                       | June 27, 1900. | June 30, 1900. | May 30, 1900. | June 29, 1899. |
|-------------------------------------------------------|----------------|----------------|---------------|----------------|
| <b>PIG IRON:</b>                                      |                |                |               |                |
| Foundry Pig, No. 2, Standard, Philadelphia.....       | \$18.00        | \$18.50        | \$20.00       | \$18.50        |
| Foundry Pig, No. 2, Southern, Cincinnati.....         | 17.75          | 18.25          | 19.75         | 17.00          |
| Foundry Pig, No. 2, Local, Chicago.....               | 19.50          | 30.00          | 21.50         | 19.00          |
| Bessemer Pig, Pittsburgh.....                         | 19.00          | 30.00          | nom           | 19.75          |
| Gray Forge, Pittsburgh.....                           | 17.00          | 17.00          | 18.50         | 17.75          |
| Lake Superior Charcoal, Chicago.....                  | 22.50          | 23.00          | 24.50         | 21.00          |
| <b>BILLETS, RAILS, ETC.:</b>                          |                |                |               |                |
| Steel Billets, Pittsburgh.....                        | 25.00          | 28.00          | 28.00         | 31.50          |
| Steel Billets, Philadelphia.....                      | 25.00          | 29.00          | 31.50         | 34.00          |
| Wire Rods, Western Mill.....                          | 35.00          | 35.00          | .....         | .....          |
| Steel Rails, Heavy, Eastern Mill.....                 | 35.00          | 35.00          | 35.00         | 28.00          |
| Spikes, Tidewater.....                                | 2.15           | 2.15           | 2.25          | 1.85           |
| Splice Bars, Tidewater.....                           | 2.00           | 2.15           | 2.30          | 1.75           |
| <b>OLD MATERIAL:</b>                                  |                |                |               |                |
| O. Steel Rails, Chicago.....                          | 11.00          | 12.00          | 13.00         | 14.50          |
| O. Steel Rails, Philadelphia.....                     | 17.00          | 17.00          | 19.00         | 15.50          |
| O. Iron Rails, Chicago.....                           | 15.00          | 15.00          | 16.00         | 18.00          |
| O. Iron Rails, Philadelphia.....                      | 17.00          | 17.00          | 20.00         | 19.50          |
| O. Car Wheels, Chicago.....                           | 18.00          | 20.00          | 24.00         | 16.00          |
| O. Car Wheels, Philadelphia.....                      | 18.00          | 18.00          | 20.00         | 16.00          |
| Heavy Steel Scrap, Chicago.....                       | 11.00          | 12.50          | 13.00         | 14.00          |
| <b>FINISHED IRON AND STEEL:</b>                       |                |                |               |                |
| Refined Iron Bars, Philadelphia.....                  | 1.50           | 1.55           | 1.70          | 2.00           |
| Common Iron Bars, Youngstown.....                     | 1.50           | 1.60           | 1.90          | 1.80           |
| Steel Bars, Tidewater.....                            | 1.60           | 1.65           | 1.90          | 2.05           |
| Steel Bars, Pittsburgh.....                           | 1.40           | 1.50           | 1.80          | 2.00           |
| Tank Plates, Tidewater.....                           | 1.55           | 1.60           | 1.65          | 2.50           |
| Tank Plates, Pittsburgh.....                          | 1.30           | 1.40           | 1.65          | 2.25           |
| Beams, Tidewater.....                                 | 2.05           | 2.05           | 2.40          | 1.95           |
| Beams, Pittsburgh.....                                | 1.90           | 1.90           | 2.25          | 1.75           |
| Angles, Tidewater.....                                | 1.95           | 1.95           | 2.40          | 1.85           |
| Angles, Pittsburgh.....                               | 1.80           | 1.80           | 2.25          | 1.75           |
| Skelp, Grooved Iron, Pittsburgh.....                  | 1.45           | 1.50           | 1.67½         | 2.15           |
| Skelp, Sheared Iron, Pittsburgh.....                  | 1.45           | 1.50           | 1.70          | 2.25           |
| Sheets, No. 27, Chicago.....                          | 3.10           | 3.30           | 3.35          | 3.05           |
| Sheets, No. 27, Pittsburgh.....                       | 2.50           | 3.00           | 3.15          | 2.85           |
| Barb Wire, f.o.b. Pittsburgh.....                     | 2.80           | 2.80           | 2.80          | 2.95           |
| Wire Nails, f.o.b. Pittsburgh.....                    | 2.30           | 2.30           | 2.30          | 2.35           |
| Cut Nails, Mill.....                                  | 2.05           | 2.05           | 2.05          | 2.05           |
| <b>METALS:</b>                                        |                |                |               |                |
| Copper, New York.....                                 | 16.25          | 16.25          | 16.50         | 18.00          |
| Spelter, St. Louis.....                               | 4.05           | 4.00           | 4.37½         | 5.50           |
| Lead, New York.....                                   | 4.25           | 3.75           | 4.00          | 4.45           |
| Lead, St. Louis.....                                  | 4.20           | 3.65           | 3.95          | 4.35           |
| Tin, New York.....                                    | 30.25          | 30.00          | 29.25         | 36.15          |
| Antimony, Hallett, New York.....                      | 9.62½          | 9.62½          | 9.75          | 10.00          |
| Nickel, New York.....                                 | 55.00          | 55.00          | 55.00         | 38.00          |
| Tin Plate, Domestic Bessemer, 100 lbs., New York..... | 4.84           | 4.84           | 4.84          | 4.05           |

### Chicago. (By Telegraph.)

Office of The Iron Age, 806 Fisher Building, {  
CHICAGO, June 27, 1900. }

There are strong suggestions of a better temper in the Western markets. These show themselves in a more earnest inquiry for quite a number of products. Actual buying has not improved greatly, especially for forward deliveries. The consuming trade is waiting for the turn of the market. As soon as it becomes apparent that values are solidifying a large business is almost inevitable from the peculiar state in which the markets have drifted. But it is not assured that bottom has been reached in many lines, and hence the hesitation. It is reported that not only will many of the rolling mills close during the first half of July or longer, but that quite a number of forging works and other plants will take similar action. With the possibility of labor uncertainties next week, the outlook is for a considerably decreased production with the coming month. The upturn in Lead, in Carriage Bolts and some other finished products is also yielding its influences against a demoralized condition that has had its own sweet and uninterupted way for many months. The situation is mixed, but is far less one-sided than several weeks ago.

**Pig Iron.**—The renewed interest in Pig Iron is quite notable. Consumers are taking heed intently and seeking some solid basis upon which to make purchases for the last half of the year. It is not the half hearted inquiry of the past, but an anxious desire to get down to solid ground. Values continue unsettled. Prices quoted below are in a measure nominal and the little trading that has been done for deliveries extending through the latter half of the year have been at lower prices. But there have been massed up against the future unusually large requirements, and once the buying begins it will be necessarily notable. One of the largest sellers here remarks that within the past three months the company he represents has sold only three lots of over 200 tons each. They aggregated less than 5000 tons. Ordinarily this would have been scarcely a fair week's trade. Hence it is time for a more active period. Both buyer and seller are more desirous to reach conclusions and are closer together than for many months. The attitude of Southern producers is not clearly outlined. The larger production companies are practically out of the market

by adhering to higher quotations than those current. It is stated that an extension of the labor troubles in the South is threatened July 1, and that a substantial reduction of the present prices will throw quite a number of the less economical furnaces out of blast. Melters continue their policy of buying only for immediate needs, though the aggregate makes a quite respectable showing. For quick deliveries quotations are as follows:

|                                                               |                    |
|---------------------------------------------------------------|--------------------|
| Lake Superior Charcoal.....                                   | \$22.50 to \$23.50 |
| Local Coke Foundry, No. 1.....                                | 20.00 to 20.50     |
| Local Coke Foundry, No. 2.....                                | 19.50 to 20.00     |
| Local Coke Foundry, No. 3.....                                | 18.50 to 19.50     |
| Local Scotch, No. 1.....                                      | 20.00 to 20.50     |
| Ohio Strong Softeners, No. 1.....                             | 22.00 to 23.00     |
| Southern Silvery, according to Silicon.....                   | 21.35 to 22.35     |
| Southern Coke, No. 1.....                                     | 20.35 to 21.35     |
| Southern Coke, No. 2.....                                     | 19.35 to 20.35     |
| Southern Coke, No. 3.....                                     | 18.35 to 19.35     |
| Southern Coke, No. 1 Soft.....                                | 20.35 to 21.35     |
| Southern Coke, No. 2 Soft.....                                | 19.35 to 20.35     |
| Foundry Forge.....                                            | 18.35 to 19.35     |
| Gray Forge and Mottled.....                                   | 18.35 to 18.85     |
| Southern Charcoal Softeners, according to Silicon.....        | 21.35 to 22.35     |
| Alabama and Georgia Car Wheel.....                            | 23.85 to 24.35     |
| Malleable Bessemer.....                                       | 20.00 to 21.00     |
| Standard Bessemer.....                                        | 21.50 to 22.00     |
| Jackson County and Kentucky Silvery, 8 per cent. Silicon..... | 26.50 to 27.00     |

**Bars.**—Reports concerning the Bar trade are conflicting. Some producers have had quite a fair trade, others not in any way notable. Many of the mills will close July 1 for at least two weeks, but several of the smaller producers, it is said, may continue operations. Consumers have very largely provided for their requirements during July, but sales have not generally been closed for a period longer than next month. The Agricultural Implement trade has not started up, pausing, it is said, until the crop prospects become somewhat more clearly defined. July, altogether, will be a rather slow month from present indications. Values are slightly lower at 1.60c. to 1.65c. for both Iron and Steel. Store prices hold well at about 2c., some trade going even above that price. Hoops and Bands are nominally 2.60c., base.

**Structural Material.**—The increased business following the reduction in Shapes has been less marked in the West than in the East. Betterment here is confined chiefly to small lots. Of that class of trade the improvement has been notable throughout the West, but not especially marked locally. There is a slightly better feeling in the city and business is not quite at the low ebb of the past few months, but it appears in the form of small constructions. Large enterprises await the issues involved in the labor disputes. Prices are generally firm. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 2.05c.; 18 inches and over, 2.15c.; Angles, 3 inches and over, 1.95c.; Angles under 3 inches, 1.75c.; Tees, 2.10c.; Universal Plates, 1.65c. to 1.75c. From local yards small lots of Beams and Channels are quoted 2.55c. to 2.75c.; Angles, 2.20c. to 2.30c. rates, and Tees, 2.40c. to 2.60c.

**Plates.**—The somewhat better buying in Plates noted last week continues and trade seems to be resuming its natural conditions. However, there are few if any large contracts being closed, business being limited to early needs, of which there are a plenty. Values are still weak. Tank is quoted 1.60c. to 1.70c. from mill, and Flange 1.80c. to 2c. Jobbers quote Tank from store at 2c. to 2.10c., and Flange, 2.20c. to 2.35c.

**Merchant Pipe.**—In a small way a quickening of demand is noticeable. It is a steady buying in limited quantities, going into depleted stocks, which, owing to the seasonable requirement, must be replenished without delay. Prices are without change, as follows:

| Sizes.                     | Black.  | Galvanized. |
|----------------------------|---------|-------------|
| 1/4 to 3/8 inch.....       | 45 7-10 | 29 7-10     |
| 1/2 inch.....              | 56 2-10 | 40 2-10     |
| 3/4 inch.....              | 63 2-10 | 47 7-10     |
| 1 to 4 inches.....         | 63 2-10 | 47 7-10     |
| 4 1/2 to 12 inches.....    | 60 2-10 | 44 7-10     |
| 1 to 4 inches, R. & P..... | 61 2-10 | 44 7-10     |

**Sheets.**—A fair trade in Sheets is reported. It is not especially active, but is perhaps up to the ordinary season's requirement, though stocks in the hands of jobbers are said to be full. From mill prices are firm, but from store a slight sagging tendency is noticeable. From store Black Sheets are quoted at 3.50c. to 3.55c., and Galvanized at 70 and 5 per cent.

**Merchant Steel.**—The half year is going out with little trade excitement or even interest in the Merchant Steel trade. There is scarcely enough business to establish a market, though coming needs will be large from present indications. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Tire, 2.20c. to 2.40c.; Open Hearth Spring Steel, 2.75c. to 3c.; Toe Calk, 3c. to 3.25c.; Sleigh Shoe, 2c. to 2.25c.; Cutter Shoes, 2.75c. to 3c.; Ordinary Tool Steel, 7c. to 7 1/2c.; Special, 13c. and upward.

**Rails and Track Supplies.**—The rail situation is more interesting at present from an operating standpoint than from that of the sales department. The mills continue busy and new transactions are not large. Rails are unchanged at \$35 to \$37 for Standard Sections, and \$36 to \$38 for Light Rails. Spikes are quoted 2c. to 2.10c.; Bolts, with Hexagon Nuts, 2.75c. to 2.90c.; Square Nuts, 2.65c. to 2.75c.; Links and Pins, Steel or Iron, 2.25c. to 2.50c.

**Old Material.**—This branch of trade seems the weakest of all. Demand is slightest. Mills in operation are using up old stock in preference to the purchase of fresh supplies and there are moderately large offerings that are more or less urgent. The result is to crowd values further down the long declivity. The market is unnatural and responds readily to slight influences. Railways continue to sell freely, though not to the same degree as a month ago. Values are still more than ordinarily uncertain and there have been transactions both above and below the following approximate quotations per gross ton:

|                                     |                    |
|-------------------------------------|--------------------|
| Old Iron Rails.....                 | \$14.00 to \$15.00 |
| Old Steel Rails, mixed lengths..... | 11.00 to 12.00     |
| Old Steel Rails, long lengths.....  | 12.00 to 13.00     |
| Relaying Rails.....                 | 22.00 to 24.00     |
| Old Car Wheels.....                 | 18.00 to 19.00     |
| Heavy Melting Steel Scrap.....      | 11.00 to 12.00     |
| Mixed Steel.....                    | 9.00 to 10.00      |
| Iron Fish Plates.....               | 14.00 to 14.50     |
| Steel or mixed ditto.....           | 13.50 to 14.50     |
| Iron Car Axles.....                 | 16.50 to 17.50     |
| Steel Car Axles.....                | 15.00 to 16.00     |
| No. 1 Railroad Wrought.....         | 12.50 to 13.50     |
| No. 2 Railroad Wrought.....         | 11.50 to 12.50     |
| Shafting, Iron and Soft Steel.....  | 15.00 to 16.00     |
| No. 1 Wrought.....                  | 12.00 to 12.50     |
| No. 1 Country Wrought.....          | 11.00 to 12.00     |
| No. 1 Mill.....                     | 8.00 to 8.50       |
| No. 2 Mill.....                     | 7.00 to 7.50       |
| No. 1 Busheling.....                | 9.00 to 9.50       |
| No. 2 Busheling.....                | 8.00 to 8.50       |
| Iron Car Axle Turnings.....         | 9.00 to 10.00      |
| Soft Steel Axle Turnings.....       | 8.50 to 9.50       |
| Machine Shop Turnings.....          | 6.50 to 7.00       |
| Wrought Drillings.....              | 6.00 to 6.50       |
| Cast Borings and Drillings.....     | 5.00 to 6.00       |
| Mixed Borings and Turnings.....     | 5.00 to 6.00       |
| No. 1 Bolders, cut.....             | 10.00 to 11.00     |
| No. 2 Bolders, cut.....             | 6.00 to 6.50       |
| Boller and Ship Scrap.....          | 12.00 to 12.50     |
| No. 1 Cast.....                     | 11.00 to 11.50     |
| No. 2 Cast.....                     | 7.50 to 8.00       |
| Railroad Malleable Cast.....        | 10.50 to 11.00     |
| Agricultural Malleable Cast.....    | 9.50 to 10.00      |

**Metals.**—Both before and since the two advances in Lead this week the demand has shown noteworthy improvement. Desilverized is quoted at 4.20c. in lots of 50 tons, and Corroding, 4.30c. Copper is fairly steady, with a good average demand for immediate shipments. Lake is 16 1/2c., and Casting 16 1/4c.

## Philadelphia.

Office of The Iron Age, Forrest Building, 1  
PHILADELPHIA, PA., June 28, 1900.

It is a difficult matter to define the exact status of the Iron and Steel markets. That it is dull and that prices are weak is indisputable, but what it may be two or three weeks hence is a profound mystery. There are possibilities on both sides, and they are not so very unevenly balanced either, but it is hardly worth while to discuss them in detail, as it would involve too many "ifs" and "buts." At this season of the year there is always more or less doubt in regard to the extent and the character of the output during the midsummer weeks, and this year the situation is more than ordinarily complicated by the adverse crop reports, which while admittedly bad are still subject to revision. The trade recognize these and other facts which have an important bearing on the situation, and are therefore determined to be on the safe side, buying only for immediate wants, leaving themselves free to act promptly and vigorously as soon as it becomes reasonably clear which side of the market is the safe side. At present buyers can undoubtedly do considerably better as regards prices than at any time during the year, and although stocks in second hands are extremely light, and are certain to require liberal replenishment in the near future, there are no indications of any desire to fill up at the figures now ruling, or to make firm offers at still less money. This is in distinct contrast to last year, when buyers could not be driven away, while at the present time they cannot be driven in. This, however, may all be changed in two or three weeks' time, but in the meantime there is no reason to expect anything but a waiting market.

**Pig Iron.**—A fairly active business has been met with, but mostly for small lots, except Basic, which has been taken in good quantities without any serious concessions from the rates ruling during the last period of activity. There is also a particularly good demand for Charcoal Irons, which, however, are extremely scarce.



Foundry Irons are in full supply, and the pressure to realize shows no abatement, although there is not much change in quotations, simply because buyers for large lots cannot be found, even though material concessions could be had. Such demand as there is, is met at about \$18.50 for No. 2 X Foundry, delivered. In some cases \$19 and over is paid, while in others \$18 is not refused, and in some special cases nearly \$1 less than that has been accepted. Freight from that particular furnace were very low, however, but the difference would not average more than 25c. to 50c. per ton, as compared with other furnaces making a similar quality of iron. But the market is very varied, and prices are in nearly all cases a matter of arrangement between buyer and seller, and are made without regard to what the general market may be. The general tendency, however, is toward lower figures, and as we said before, it only requires the right kind of a bid to secure iron on satisfactory terms. Prices are about as follows for Philadelphia or nearby points: No. 1 X Foundry, \$19 to \$20; No. 2 X Foundry, \$18 to \$19; No. 2 Plain, \$17 to \$17.50; Basic, \$20 to \$21; Bessemer, nominal, \$20 to \$22; Low Phosphorus, \$25 to \$26; Charcoal Iron, \$25 to \$27.

**Billets.**—There is nothing doing of any account, so that prices are hardly quotable. It is said, however, that \$28 could be done for round lots, but at the moment no one seems to want any but small lots, which have sold at \$29 and upward.

**Plates.**—There is very little change from last week, and prices are fairly steady at about 1.50c., at mills. There is considerable business in prospect and a fair amount taken; but it is not likely that many new or important engagements will be made until after the holidays. Most of the mills are anxious for business, and it is not unlikely that very low quotations would be made, providing bids were promptly made for good sized lots. Prices for nearby deliveries about as follows: Steel Plates, ¼-inch and thicker, 1.55c. to 1.60c.; Universals, 1.60c. to 1.65c.; Shell, 1.70c. to 1.75c.; Flange, 1.80c. to 1.90c.; Charcoal Iron Plates, C. H. No. 1, 2.60c.; Best Flange, 3.10c.; Fire Box, 3.60c.

**Structural Material.**—There is as much business as could be expected at this season, but it is mostly in small orders, large contracts being held in abeyance temporarily. The mills are busy, however, and as yet there are no indications of any general shortening up in time, although something will depend on the amount of business that comes in during the next two or three weeks and on the length of time the mills will shut down for holidays. Prices are unchanged as follows for seaboard and nearby points: Beams and Channels, 15-inch and under, 2.03c.; Angles, 3 to 6 inches, 1.93c.

**Bars.**—Business is dull, and it requires sharp skirmishing to bring in enough work to offset the outgoings. Prices are irregular, and range anywhere from 1.40c., at mill, to 1.50c., but all depends on what is wanted, and how much is wanted, and the specifications for sizes, deliveries, &c. Prices are as follows: In some cases less than 1.50c., at mill, has been accepted for Best Refined Iron, but 1.50c. to 1.60c., delivered, is the usual range for carload lots and upward. Steel Bars, 1.60c. to 1.70c.

**Sheets.**—Thin Sheets go very well, but it is difficult to secure much business on the low numbers. Prices are easy and quoted about as follows for best Sheets. (Common Sheets two-tenths less): No. 10, 2.30c.; No. 14, 2.40c.; No. 16, 2.50c.; Nos. 18-20, 3c.; Nos. 21-24, 3.10c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

**Old Material.**—There is no regular market, so that prices are still about "what you can get." On pressure to sell it is hard to say what prices would be, but in a general way bids and offers for deliveries in buyers' yards would be about as follows: Choice Railroad Scrap, \$15 to \$17; No. 1 Yard Scrap, \$12 to \$13; No. 2 Light Scrap, \$10 to \$11; Machinery Cast, \$14 to \$15; Heavy Steel Scrap, \$16 to \$17; Old Iron Rails, \$17 to \$19; Old Steel Rails, \$17 to \$18; Wrought Turnings, \$9 to \$10; Cast Borings, \$8 to \$9; Old Car Wheels, \$18 to \$20; Iron Axles, \$17 to \$19; Steel Axles, \$16 to \$17.

## Cincinnati. (By Telegraph.)

Office of The Iron Age, Fifth and Main streets, {  
CINCINNATI, June 27, 1900. }

The situation in Pig Iron at this writing does not seem to have changed materially from that of a week ago. The only marked difference is in the divergence of furnace ideas as to what iron ought to sell at under the circumstances. Take No. 2 Southern Foundry, for example, and we find some leading interests insisting on \$16, Birmingham, and others apparently anxious to sell on the basis of \$14.50. The outlook throughout the South is considered unfavorable for producers, and wet weather, labor and other troubles seem to point to a de-

clined curtailment of output in the very near future. The number of orders being booked is quite good, but lately the tonnage is inconsequential. Buyers are still standing aloof, and except for carload orders for piecing out purposes their presence in the country at all would seem almost mythical. Prices continue to sag and the outlook is for a continuance of the present dullness. Freight rate from Birmingham is \$3.25 to this point, from the Hanging Rock district \$1. We quote, f.o.b. Cincinnati:

|                                |                    |
|--------------------------------|--------------------|
| Southern Coke, No. 1.....      | \$18.75 to \$19.50 |
| Southern Coke, No. 2.....      | 17.75 to 18.50     |
| Southern Coke, No. 3.....      | 16.75 to 17.50     |
| Southern Coke, No. 4.....      | 15.50 to 16.00     |
| Southern Coke, No. 1 Soft..... | 18.75 to 19.50     |
| Southern Coke, No. 2 Soft..... | 17.75 to 18.50     |
| Southern Coke, Gray Forge..... | 15.25 to 15.50     |
| Southern Coke, Mottled.....    | 15.00 to 15.50     |
| Ohio Silvery, No. 1.....       | to 26.00           |
| Ohio Silvery, No. 2.....       | to 25.00           |
| Lake Superior Coke, No. 1..... | to 19.00           |
| Lake Superior Coke, No. 2..... | to 18.00           |
| Lake Superior Coke, No. 3..... | to 17.00           |

### Car Wheel and Malleable Irons.

|                                       |                    |
|---------------------------------------|--------------------|
| Standard Southern Car Wheel, Chilling |                    |
| Grades .....                          | \$23.75 to \$24.25 |
| Standard Southern Car Wheel, No. 2..  | 22.75 to 23.25     |
| Lake Superior Car Wheel and Mal-      |                    |
| leable .....                          | to 24.50           |

**Old Material.**—The market is dull and prices are nominally unchanged. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$11 to \$12; Cast Railroad and Machine Scrap, \$9.50 to \$10; Iron Axles, \$17 to \$18; Iron Rails, \$14 to \$15; Car Wheels, \$16 to \$17, all quotations per gross ton.

## St. Louis (By Telegraph)

Office of The Iron Age, 1205 Chemical Building, {  
St. Louis, June 27, 1900. }

**Pig Iron.**—Inquiry has fallen off this week, and sales are proportionately lighter. These bear evidence of providing for necessities only. It is idle to make a forecast of the market a month hence, it being in fact somewhat difficult to harmonize the various opinions of conditions as found to-day. The market is not in shape to admit of quotations bearing any degree of accuracy. The principal producers seem to hold firmly to better prices than are recorded below. For instance, sales of No. 2 Foundry, for small tonnage to be sure, were made in this market during the past week at \$17, Birmingham. Some smaller producers appear ready to take orders for No. 2 on a basis of \$15, Birmingham. Furnaces are not disposed to quote unless the inquiry bears evidence of an actual need on the part of the correspondent. Even when the want is demonstrated the buyer, if in personal contact with the seller, is quite generally asked to make an offer. The "wet weather" furnaces, which can only be operated profitably when high prices prevail, are said to have rather discouraging experiences at present. The following quotations, compared with last week show reductions, but they should be taken as nominal. Freight rate, Birmingham to St. Louis, is \$3.75 per ton. We quote nominally f.o.b. St. Louis:

|                              |         |
|------------------------------|---------|
| Southern, No. 1 Foundry..... | \$19.75 |
| Southern, No. 2 Foundry..... | 18.75   |
| Southern, No. 3 Foundry..... | 17.75   |
| No. 1 Soft.....              | 19.75   |
| No. 2 Soft.....              | 18.75   |
| Gray Forge.....              | 16.75   |

**Bars.**—Orders are more plentiful, and indicate a desire to sort up stock prior to shut down of mills. Dealers are in receipt of a large number of orders, but specifications manifest intention of buyers to buy lightly. The market is said to be comparatively bare of stock, so far as jobbers and consumers are concerned. Prices are easier, and we quote 1.65c. to 1.70c., half extras, East St. Louis, for iron and steel for heavy tonnage. Jobbers quote 2c., full extras, for lots of several tons; smaller quantities 2.10c. to 2.25c., full extras, iron or steel.

**Rails and Track Supplies.**—Inquiry for Rails of Heavy Section is coming in, but not equal to last year. Some new projects are spoken of, but in the main established lines have their improvements provided for. Light Section Rails are in fair demand. We quote Splice Bars, Iron or Steel, 1.90c. to 2.25c.; Track Bolts, with Square Nuts, 2.55c. to 2.80c.; with Hexagon Nuts, 2.70c. to 2.95c.; Spikes, 2c. to 2.10c.; Links and Pins, 2.40c.

**Pig Lead.**—The market has had another stirring up, this time caused by an advance of 37½c. Monday and a second one of 12½c. on Tuesday. Desilverized is therefore placed at 4.20c., St. Louis, Tuesday. Chemical is bid for to-day at that price. Missouri producers are again inclined to keep out of the market in order to be in position to take the benefits to be had from higher prices. Lead Ore is looming up, with an advance of \$2.50 per ton, selling at \$43 per ton. There is a better feeling on the part of miners and producers following the advances made on Lead.

**Spelter.**—Prices are a trifle stiffer; 4.05c. has been bid and refused. The improvement is but slight in view of the close association of Spelter with Iron and Steel products. Ores declined 1, the top price being \$27 per ton.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building,  
Pittsburgh, June 27, 1900.

(By Telegraph.)

**Pig Iron.**—The market continues very dull and prices are weak. The nominal price of Bessemer Iron is \$20, Pittsburgh, but it is being offered at \$19, and probably better could be done if there were any purchasers. With few exceptions the furnaces are piling Iron and lower prices seem certain. In the present condition of the market only nominal quotations can be given, and these are \$19 to \$20 for Bessemer Iron. There have been no sales. If a large consumer came into the market for a round block of Iron he could probably buy it a good deal under the above prices. Forge Iron is quiet, but is quoted at \$17, Pittsburgh. We note a sale of 1000 tons at that price. Only small lots of Foundry Iron are being sold, and we quote No. 2 at \$18.25 to \$19, Pittsburgh. On a round lot running over two or three months it is possible our lower price for No. 2 Foundry could be shaded.

**Billets.**—There is practically nothing doing. The nominal price of Bessemer Billets is \$28, Pittsburgh, but Steel is being offered at \$26 and lower, without finding buyers. Basic Billets are also being offered at considerably less than the established price of \$29. Very little Steel is being sold in the open market, for the reason that consumers are covered by contracts, prices for which are based on the average price of Standard Bessemer Iron f.o.b. Pittsburgh. The lower the price for Iron the lower the price for conversion, and at \$19 to \$20 for Iron, Steel would not cost on these contracts above \$25 to \$26, and perhaps less in some cases.

**Sheet Bars.**—The nominal price of Bessemer Bars is \$29 and Basic \$30, maker's mill. However, the few consumers, aside from the American Sheet Steel Company, are covered by contracts, most of which are based on the price of Standard Bessemer Iron f.o.b. Pittsburgh.

**Muck Bars.**—We do not hear of any sales since our last report. We quote Standard Grade Muck Bar at \$27, Pittsburgh. On a firm offer this price might be shaded.

**Spelter.**—A week ago prime Western Spelter was offered at this market as low as 4.10c., Pittsburgh, but in the last few days there has been a heavier export demand and prices have advanced to 4.25c., Pittsburgh, for best grades of Spelter.

(By Mail.)

There has been no improvement whatever in the Iron trade, but the situation really seems to be worse. Buying is practically at a standstill, orders being placed for very small lots and actual wants. That the Iron trade is in a serious condition is evident, and it will simply have to take its own course and prices settle down to a point where buyers believe it safe to take hold before there will be any improvement in business. Just how low prices will have to go no one can tell. If Bessemer Iron were offered to-day at \$15 and Steel at \$21 or \$22, it is doubtful if business could be done. On the other hand, when the situation has reached that point that buyers will have to cover, business may start up with prices above \$15 for Iron and \$22 for Steel. A general shut down of the mills will take place July 1, and if this continues long enough it may improve the situation. There probably never has been before in this country a similar condition to that which now exists in the Iron trade. It is simply out of the question to sell material at any price. Of course, we have had before periods of depression in the Iron trade, but it was possible in those times to sell material if prices were low enough. Just now it is doubtful if buyers would take hold until they were absolutely sure that prices were at cost or below. Stocks all over the country are very low, and when a buying movement does set in there will likely be a good healthy demand that will continue for some time. When this will come, however, is the problem that confronts everybody in the Iron trade to-day, and which no one is able to solve.

**Plates.**—The very low prices ruling for Plates have brought out more inquiry, but the actual amount of new tonnage being placed shows no improvement. Buyers place orders only when they have to, and for small lots. The contracts for Plates and Shapes for the East River Bridge were postponed for one week, and come up again on Thursday, June 28. Several local mills have recently taken some good sized orders for Sheared Plates for the Standard Oil Company at low prices. We quote Tank Plate, 1/4-inch and heavier, 1.30c. to 1.40c.; Shell, 1.40c. to 1.50c.; Flange, 1.50c. to 1.60c.; Fire Box, 2.25c. to 3c., depending on quality.

**Ferromanganese.**—The market is weaker, and we quote 80 per cent. Ferromanganese at \$90, delivered buyers' mill.

**Structural Material.**—The recent reduction of \$7 on Beams and \$9 on Angles has brought out a good deal of inquiry, and a fair tonnage is being sold. A local mill has recently taken several large orders for Structural Material for export. We quote Beams and Channels up to 15-inch at 1.90c.; over 15-inch, 2c.; Angles, 3 to 6 inch inclusive, 1.80c.; over 6-inch, 1.90c.; under 3-inch, 1.60c. to 1.70c.; Tees, 1.90c.; Bars, 1.95c.; Universal and Sheared Plates, 1.30c. to 1.40c., all f.o.b. Pittsburgh.

**Sheets.**—The Sheet trade is very dull, like everything else; and demand is light. There is a good deal of unevenness in prices on Sheets, jobbers and dealers making lower prices in some cases than the mills. With the continued decline in raw material lower prices on Sheets are certain. We quote No. 27 Black Sheets, box annealed, one pass, at 2.90c. to 2.95c.; No. 28, 2.95c. to 3c. Some small lots of Galvanized are being sold at 70 and 10 per cent., 15c. freight, and in some cases 20c. is allowed.

**Bars.**—There has been a slightly better demand in the past few days, probably due to the closing down of the mills on July 1. Orders, however, continue to be placed only for small lots. The large consumers of Bars, like the agricultural implement makers, are holding off until the market has reached the point where they deem it safe to place their contracts. We quote Steel Bars at 1.40c. at mill. We quote Iron Bars at 1.50c. to 1.60c. at mill, both carrying half extras. We quote Hoops and Bands at 2.25c. to 2.40c., depending on the order. For desirable business our lower price on Hoops and Bands would be shaded.

**Skelp.**—Some good sized orders for Skelp have recently been placed by the Standard Oil interest to be rolled into Pipe under a conversion contract. Prices on Skelp are lower, and we are advised of a sale of Grooved Iron Skelp at 1.45c., delivered, equal to about 1.42 1/2c., maker's mill. We quote Grooved or Sheared Iron and Steel Skelp at 1.45c., f.o.b. Pittsburgh.

**Pipes and Tubes.**—A somewhat better demand for Tubular goods is reported, considerable tonnage having recently been placed, included in which were orders for some round lots. However, buyers are placing orders mostly for small lots, believing that prices will be lower. With the continued decline in raw material lower prices on Pipe are certain, and it is probable that within a few days a new and lower range of discounts will be issued. Nominal quotations to consumers in carload lots are as follows:

| Merchant Pipe.                           |                      |                     |
|------------------------------------------|----------------------|---------------------|
|                                          | Black.<br>Per cent.  | Galvd.<br>Per cent. |
| 1/8, 1/4, 3/8 inch.....                  | 47 1/2               | 31 1/2              |
| 1/2 inch.....                            | 58                   | 42                  |
| 3/4 to 4 inch, inclusive.....            | 65                   | 49 1/2              |
| 4 1/2 to 12 inch, inclusive.....         | 62                   | 46 1/2              |
| Boiler Tubes.                            |                      |                     |
|                                          | Steel.<br>Per cent.  | Iron.<br>Per cent.  |
| 1 to 1 1/2 inch.....                     | 30                   | 26                  |
| 1 1/2 to 2 1/4 inch.....                 | 35                   | 32                  |
| 2 1/4 to 8 inch.....                     | 55                   | 52                  |
| 2 1/2 and 9 to 13 inch.....              | 45                   | 42                  |
| Casing.                                  |                      |                     |
|                                          | S. & S.<br>Per cent. |                     |
| 2 to 2 3/4 inch.....                     | 42                   |                     |
| 3 to 4 1/2 and 7 1/2 to 12 1/2 inch..... | 56                   |                     |
| 4 3/4 to 7 1/4 inch.....                 | 60                   |                     |

It should be noted, however, that these prices are being shaded more or less, jobbers desiring to move stocks as fast as possible in anticipation of another material reduction in prices.

**Merchant Steel.**—A meeting of the Tool Steel makers was held last week, and it was decided to advance the price of Tool Steel from 6 1/2c. to 7c. The general market is dull, and all kinds of low prices are being made. Nominal quotations on Tire Steel are 1.90c. to 2c.; Toe Calk, 2c. to 2.10c.; Open Hearth Basic, 2.50c. to 2.75c., depending on quality; Plow Slabs, 2c. to 2.25c., according to grade; Rolled Lay Steel, 3c.; Hammered Lay Steel, 3.50c.; terms 60 days, 2 per cent. off for cash in 10 days.



For attractive orders it is probable the above prices would be shaded. On Tool Steel freight allowance not to exceed 25c. is made.

**Coke.**—Production of Coke in the Connellsville region fell off sharply last week. Out of 20,341 ovens in the region, 17,458 were active and 2883 idle, the output being 178,060 tons, a decrease of over 4000 tons over the previous week. There is very little demand for either Furnace or Foundry Coke, and we do not hear of any business being placed. We quote strictly Connellsville Furnace Coke at \$2.50 to \$2.75 and Foundry at \$3 net ton at oven. It should be noted, however, that outside Coke is being offered at lower prices than the above.

**Iron and Steel Scrap.**—There is practically no market on Scrap. Consumers are able to buy at about what they want to pay. The Scrap trade is in very unsatisfactory condition, and it looks very much as though prices will be still lower. Consumers are not buying, except in small lots, and for actual wants. It is hoped, however, that after the usual summer shutdown of the mills demand for Scrap will improve. We quote: No. 1 Railroad Wrought Scrap, \$13 net ton; Borings, \$6.50 to \$7; Turnings, \$8.50 to \$9; Heavy Melting Stock, \$14 to \$14.50; Basic Melting Stock, \$17 to \$18; Horseshoes, \$15 net ton; Old Iron Rails, \$16 to \$17; Cast Scrap, \$13 to \$13.50 net ton. We note a sale of 100 tons of No. 1 Railroad Wrought Scrap at \$13 net ton.

## Cleveland.

CLEVELAND, OHIO, June 26, 1900.

**Iron Ore.**—The shippers of Iron Ore are feeling very comfortable in view of the conditions that prevail as to the rates on the carrying of that commodity down the lakes. This signifies that the trend of the market is against the interests of the vessel owners. This has not been a vessel owners' year, save as to the conditions surrounding the chartering of tonnage last fall. The season opened two weeks before most of the owners expected it to, and found them not ready. The mine operators were not ready, nor were the stock piles in shape. The result was that boats were slow at the outset in getting cargoes. Since that time the movement of Ore has been very rapid. Vesselmen had allotted their tonnage with the expectation of labor disturbances early in the season. They counted on some of their boats being held up at the lower lake docks and planned to carry less Ore in May and June on that account. By an agreement early in the year labor disturbances were made impossible, and boats therefore have been moving as fast as cargoes could be obtained for them and as fast as the lower lake docks could receive the Ore when shipped. As a result of this vessels have carried more Ore than it was thought they would. Vesselmen are now finding that they are ahead on their June shipments, even as they were far ahead on the shipment at the end of May. A good many of the vessel owners found that with one trip left for their boats for June they had no contract Ore with which to load them. This threw all of these boats on the market to carry wild Ore or grain. Most of them prefer the former. This condition obtains especially at Duluth and Marquette and other Lake Superior ports, but it is equally true with regard to the shipment out of Escanaba. Shippers therefore who want wild tonnage can get any amount of it. Some are taking it freely, while others are cautious. The one thing they have to guard against is not to take too much wild tonnage now, that they may have plenty of Ore to give to the contract boats the latter part of the year. Shippers, in view of the conditions prevailing in the general Iron market, are not sure that much more than the amount of Ore under contract to be moved down the lakes (18,000,000 tons) will be needed this year. If not, they will be able to move the wild Ore with what small tonnage they can get at any time. If the market demands more, they feel that it is worth the extra money they may have to pay later in the year, to be on the safe side now. In consequence of this condition the demand for wild tonnage is exceedingly light, with an abundance of wild boats on the market. Even with all conditions in their favor shippers are showing no disposition to break the rates, consequently carrying freights remain as they have been, \$1 from the head of the lakes, 90c. from Marquette, and 70c. from Escanaba. The slow movement away from Escanaba is best indicated by a condition. A number of boats were chartered with the understanding that they should go up light. This condition was imposed to assure a rapid manipulation of the boats and a consequent heavy movement of Ore. Since the opening of the season any number of these boats have been forced to take up cargoes, as the owners knew that their cargoes of Ore would not be ready for them.

**Pig Iron.**—There is a feeling of uncertainty that per-

vades the Pig Iron market. Buyers are reaching out to feel where the furnaces stand, and the latter are doing the same with reference to the buyers. There is no fixed price at which business is done, neither is there any fixed demand upon which to base a scale of prices. Contracts under which shipments have been made up until now are expiring and no new ones are taking their places. Buyers are therefore depending on the open market to supply their present needs. They are not buying for the future, neither do they seem to be planning for the future. They are simply buying carloads at a time to supply the present need and are not laying in one ton more than they are forced to. They seem to be waiting, for what no one seems to know. The furnacemen are selling at no fixed price. Not enough sales have been made at any one price for any quotation, that would adequately represent the market, to be given. Furnacemen look at the need of the buyer and his anxiety to get the Iron and then get from him the price that he seems willing to pay. This method necessitates a great variety of prices on the market. This being the case, no change has been made from the stock quotation, which is allowed to stand simply because no other can be named to replace it. The old prices are therefore quoted, but no business is done according to them. This week has seen few or no inquiries as to the prices of Iron for the latter part of the year. From all that can be seen, it would seem that until the market settles and until after invoices have been taken the buyers will be content to supply their needs on the open market. The conditions are such that should the buyers request prices for advance movement the furnacemen would be in a quandary to quote them a price. All appear to be waiting for something to turn up. The reduction in the price of Bessemer has had no effect on the amount of stuff sold, neither has its effect in any way been seen on the price of other Iron. It was supposed that the reduction made would coax out a little business, but the difference is hardly perceptible. The lower price was made to harmonize the quotation with others on the market, but while this is true, it is also true that the furnaces expected to do a little more business than they had done. This hope was not realized.

**Finished Materials.**—This has been a week of inquiries, but of few sales. Buyers who are planning on new work have asked for prices, and the number of them has indicated an increased interest in business generally. The outlook is better now than it has been for weeks. Old contracts were the basis of action for a long time, but the hope of new business has added much greater activity to the trade. Bridge work, which has been active all summer, is increasing; the erection of business blocks and other structures requiring Structural Irons has increased so amazingly that the inquiries are surprising. The drop of a week ago in Structural Iron had the desired effect, for the business is booming as it has not done for weeks. Increased interest is taken in shipbuilding, owing to the fact that Plates have come down to a reasonable basis. While prices are not yet to rock bottom, according to the views of many, they are nearing it, and business is picking up in consequence. From present indications an immense amount of business is in sight. Plates are still being quoted at 1.45c. and 1.50c., but with the understanding that some sales are being made at a lower figure, 1.40c. being about the price at which big contracts might be closed. This week the Carnegie Steel Company sold Plates and Shapes for a Steel steamer to be built by the American Ship Building Company for Captain John Mitchell. This sale amounted to 2800 tons. The price of Bars has been broken again. Last week they were quoted at 1.60c. and 1.65c., but this week has seen them getting closer and closer down to Plates, until now they are quoted at 1.50c. Even at that the demand for them is not large, although the inquiry on other articles has occasioned a slight interest in them also. The price on Beams and Channels, and also on Angles, remains as it has been, being 1.90c. on Beams and Channels and 1.80c. on Angles. The price of Billets remains \$28 a ton, the price established a week ago. There has been no tendency to break this price, reports to the contrary notwithstanding. This week has seen a sale of 100 tons of Billets, with inquiries for more, the prospective sale amounting to between 600 and 700 tons. Yesterday morning a sale was made of 100 tons of bridge material, the same being closed with Carnegies, and the same day the same company closed a contract with M. A. Bradley at prevailing prices for the Steel for a new business block that is to be erected in this city.

**Old Irons.**—The market has been quiet this week, as far as sales are concerned, but it has shared the joys of hope with the Finished Material market, in that it also had a number of inquiries. It seems that the prophecy made some time ago by some of the dealers that the reduction in price of other Iron would bring an

increase in business is about to be fulfilled. The market is astir, therefore, with expectancy. So far no change has been made in the prices, as the business actually done has not been heavy enough to warrant it. The feeling is that any larger order would materially change the quotations.

### The British Iron Market.

The general conditions of the Iron and Steel trades show no marked change. In the Pig Iron market prices of warrants continue their downward course, and in some cases makers have made concessions. Prices of finished material, however, are still well maintained, and the demand continues good generally. The engineering trades are well employed; but there is, apparently, less doing in the shipbuilding industry, and vacant berths in the leading Clyde yards are reported to be becoming common. The new tonnage booked last month was only 12,000 tons.

**Pig Iron.**—There has been little doing in the Pig Iron markets, but no improvement could be expected in view of the holidays, which have, of course, had their usual soporific effect upon business. Warrant prices are still declining. This week Cleveland have fallen 4 shillings to 65 shillings 6 pence, and Scotch, 4 shillings 4½ pence to 64 shillings, reducing the difference between the two to 1 shilling 6 pence. In view of this continued downward movement buyers are disinclined to operate, believing that lowest prices have not yet been reached, although Scotch Warrants are now fully 13 shillings 8 pence, and Cleveland over 13 shillings below the quotations ruling the week before Easter. The general feeling in the market is the reverse of optimistic in Glasgow and Middlesbrough, although a more cheerful feeling is apparent in South Staffordshire, where prices are maintained. In most districts, however, makers have been giving way. No. 3 Cleveland, which we quoted last week at 71 shillings, has been down to 67 shillings, but is now quoted nominally at 69 shillings, and a reduction is reported from Manchester, where Lincolnshire makers have reduced their rates to 74 shillings net for Foundry, and 72 shillings 8 pence net for Forge. Hematite Pig appears to maintain its position very well, and mixed numbers have realized 87 shillings, and even more in Middlesbrough, where makers are holding off for more.

**Manufactured Iron and Steel.**—There is little change to report in the Manufactured Iron and Steel trade. Prices in some centers have an easier tendency, but no actual reduction is reported, the result of the recent ascertainment of prices of finished Iron having encouraged makers to hold out for their full rates. In South Staffordshire there is no difficulty in getting £11 10s. for best Bars, and second qualities command £11, while the demand for common Bars is equal to the supply, and offers at less than £10 15s. are refused. In the Cleveland district, however, there is little doing at present prices and it is generally thought that a reduction is probable. In Lancashire, too, Steel is weak, and although local Billets are still quoted at £7 5s., business has been accepted at under this figure, while the demand for Steel for constructional purposes is falling off in Glasgow, and producers are more inclined to meet consumers' ideas of values. In no case, however, is there any alteration in the official rate, and although consumers appear to be holding off a little there is as yet no particular pressure to sell.

**Engineering and Shipbuilding.**—The engineering industry continues well employed on the whole, any falling off as regards new orders given out not as yet having any appreciable effect upon the general activity of trade. Locomotive builders are receiving large inquiries from the various railway companies, and although most of the orders are still held in abeyance there are indications that in this branch a fairly large amount of new work is coming forward which will insure full employment for a considerable time ahead. There is a continued dearth of new work in the shipbuilding industry, due, it is thought, to the high prices now prevailing. Scotch shipbuilders launched during May 30 vessels of 53,581 tons, as compared with 27 vessels of 26,545 tons last month, and 38 vessels of 58,919 tons in May, 1899. To the total the Clyde contributed 24 vessels of 51,411 tons, the Forth three of 950 tons, the Tay two of 1000 tons, and the Dee one of 220 tons.

**Foreign.**—In France and Belgium business is not quite so brisk as it has been lately. In Germany, however, there is no diminution of activity.

**Comparison of Prices.**—The annexed table shows the current prices compared with those of last week, and of the corresponding period last year:

|                                                  | June 7.<br>1900. | May 31<br>1900. | June 8<br>1899. |
|--------------------------------------------------|------------------|-----------------|-----------------|
| Iron Ore—                                        | s. d.            | s. d.           | s. d.           |
| Rubio, Middlesbrough .....                       | 21 3             | 21 3            | 15 9            |
| Rubio, Cardiff .....                             | 20 6             | 20 6            | 15 3            |
| Pottery Mine, North Staffordshire.               | 20 6             | 20 6            | 14 6            |
| Hematite, West Coast (at mines)...               | 17 6             | 17 6            | 13 6            |
| Pig Iron—                                        |                  |                 |                 |
| No. 3 Foundry, Middlesbrough.....                | 69 0             | 71 0            | 60 0            |
| Warrants .....                                   | 65 6             | 69 3            | 59 9            |
| Scotch Warrants, Glasgow.....                    | 64 0             | 68 4½           | 64 8            |
| Hematite Warrants, West Coast ..                 | 77 5             | 73 11           | 68 9            |
| Cold Blast (Foundry), South Staffordshire .....  | 130 0            | 130 0           | 105 0           |
| Welsh Hematite, Cardiff .....                    | 90 0             | 90 0            | 69 0            |
| Manufactured Iron and Steel—                     | £ s. d.          | £ s. d.         | £ s. d.         |
| Marked Bars, South Staffordshire                 | 11 10 0          | 11 10 0         | 8 10 0          |
| Common Bars .....                                | 10 15 0          | 10 15 0         | 7 0 0           |
| Steel Rails, Middlesbrough.....                  | 7 15 0           | 7 15 0          | 5 2 6           |
| Steel Rails, West Coast .....                    | 7 2 6            | 7 2 6           | 5 2 6           |
| Steel Rails, Cardiff .....                       | 7 7 6            | 7 5 0           | 5 7 6           |
| Steel Angles (eng.), Middlesbrough               | 8 15 0           | 8 15 0          | 7 0 0           |
| Steel Angles (eng.), Glasgow .....               | 8 7 6            | 8 10 0          | 7 0 0           |
| Steel Plates (ship), Middlesbrough               | 8 7 6            | 8 7 6           | 7 2 6           |
| Steel Plates (ship), Glasgow.....                | 8 7 6            | 8 7 6           | 7 2 6           |
| Tin Plates, Bessemer IC Cokes, South Wales ..... | 15 6             | 15 6            | 12 9            |

—The Iron and Coal Trades Review, London, June 8, 1900.

### New York.

Office of The Iron Age, 232-238 William street, New York, June 27, 1900.

**Pig Iron.**—The demand is simply of the midsummer character, just such as might be expected if conditions were absolutely normal. It is surprising, however, that a much heavier business is not being done in view of the fact that consumers have so little stock in their yards. Orders are almost invariably for small lots and for sharp delivery. On these light transactions, however, prices vary considerably. The companies manufacturing standard brands are maintaining quotations fairly well, but they are being undersold by others. These are in some instances parties who have purchased speculatively and now wish to dispose of Iron due, them on contracts. It thus happens that some grades of Iron can be purchased for \$2 per ton or more below the standard brands. Quotations in a regular way are as follows at tidewater: Lehigh and Schuylkill Irons, No. 1, \$19.50 to \$20.50; No. 2 X, \$18 to \$19; No. 2 Plain, \$16.50 to \$17.50; Gray Forge, \$15 to \$16. Southern Brands, No. 1 Foundry, \$20.50 to \$21; No. 2 Foundry, \$19.25 to \$19.75; No. 1 Soft, \$20.50 to \$21; No. 2 Soft, \$19.25 to \$19.75; No. 3 Foundry, \$18 to \$18.50; Gray Forge, \$16.75 to \$17.

**Steel Rails.**—Inquiries for Standard Sections are now rather scarce. Some small lots are occasionally wanted, but the railroad companies appear to have their needs for the season pretty well covered. The mills, however, are well supplied with work far into the autumn, and no indications are apparent of any weakening on prices for domestic business. Inquiries are being received for good quantities for Light Sections for export, and some fair orders have recently been booked. Quotations are continued at \$35 at mill in Eastern Pennsylvania for Standard Sections. Angle Bars are now quoted at 2c. to 2.20c.; Spikes, 2.15c. to 2.25c.; Square Track Bolts, 3.15c.; Hexagonal Track Bolts, 3.25c.

**Cast Iron Pipe.**—The City of Detroit will open bids on Saturday on 500 tons of small sized Pipe. This is about the only business of any moment now in sight. Trade has recently been very dull. In fact, manufacturers say they have not for many years seen business at this time of the year running so light. Quotations are continued at \$27.50 to \$28 for 8-inch Pipe at tidewater, but these prices would be materially shaded on a round lot.

**Finished Iron and Steel.**—Considerable figuring is being done on Structural work, but at the moment no contracts are in such shape as to be reported. The American Bridge Company are expecting with the recent reduction in the price of Shapes to be able to secure considerable business for export. They will certainly be better equipped to handle large foreign contracts than the constituent companies were before the consolidation. Prices of Structural Material are firmly held at the recent revised prices, but other classes of finished products are weak, and in some cases sharp concessions have been made on recently ruling figures to secure orders of even moderate size. We quote as follows at tidewater: Beams, Channels and Zees, 2.05c. to 2.15c.; Angles, 1.95c. to 2.05c.; Tees, 2.10c. to 2.20c.; Bulb Angles and Deck Beams, 2.35c. to 2.45c.; Universal Mill Plates, 1.55c. to 1.65c. Sheared Steel Plates are 1.55c. to 1.65c. for Tank, 1.65c. to 1.75c. for Shell, 1.75c. to 1.90c. for Flange, 2.20c. to 2.40c. for Fire Box, 3.50c. to 4c. for Locomotive Fire Box on dock. Charcoal Iron Plates are held at 2.80c. for C. H. No. 1; 3.30c. for Flange, and 3.80c. for Fire Box. Refined Bars are 1.55c. to 1.60c.; Common Bars, 1.45c. to 1.50c.; Soft Steel Bars, 1.65c. to 1.70c., and Hoops, 2.40c. to 2.55c., base, on dock.



**Old Material.**—Sales of Old Steel Rails have been made at \$15, f.o.b. cars in this vicinity. Old Iron Rails continue to be quoted at \$15 to \$16. Dealers report practically no demand for Scrap.

## Metal Market.

Office of The Iron Age, 232-238 William street, (New York, June 27, 1900.)

**Pig Tin.**—There was abundant evidence during the last week of a London corner, but, judging by the termination of the week's doings, the corner appears to have been rather unsuccessful. They worked the price up to £146 10s., but to-day things commenced to topple, landing at the close as low as £138 5s. Our market responded, of course, with a nominal sympathy, but as to actual transactions the English flurry passed unnoticed. Holders of stock were asking more money, but the demand is so slight that actual business was of the smallest retail character. To-day our market closed weak at 30¼c to 30.50c. for spot. Future delivery was quoted from 1c. to 2c. lower, according to delivery. London closed to-day £138 5s. for spot and £131 for futures, still showing a premium of £7.

**Copper.**—Continues to remain quiet, with prices practically unchanged. Actual spot Lake is still quoted 16¼c. and Electrolytic 16¼c. Prompt shipment of Lake for the West can, however, be secured at 16¼c., and yesterday a quantity of Casting Copper was sold on Exchange at 16c. The London market has undergone a gradual advance throughout the week, reaching £71 15s. for spot and futures. There was a 5 shilling decline, however, at to-day's closing. Best Selected remains unchanged at £7 6s. That condition of expectancy which has characterized the market during the last few weeks still exists. It is generally believed in the trade that as long as the large Lake company remains quiet the market can be held and, in fact, better prices can be commanded. If, however, they come out with one of their periodical sales, it is feared that prices will decline. The fire of a few weeks ago is thought to have delayed the anticipated sale somewhat. It is said that the Brass mills of the Naugatuck Valley are getting ready for their annual shut down, and it is hinted that they may be closed for three weeks this year.

**Pig Lead.**—Members of the trade have become quite used to surprises in this metal recently, but in the face of past events the moves of last Monday and yesterday proved somewhat staggering. The radical declines of the last few weeks are still fresh in the minds of the trade. It has been very evident that the lower prices did not accomplish the results for which they were said to have been inaugurated, and buying diminished rather than increased and merchants bought from hand to mouth, and last Thursday, when they applied at the offices of the American Smelting & Refining Company, they were told that the company were out of the market and that an announcement would be made on the following Monday. Buyers were expecting an announcement of another cut, but to the contrary, Monday brought with it an advance to 4¼c. This was followed yesterday by another advance, and to-day the company are quoting 4.25c., New York, for lots of 50 tons and more. It is reported that consumers are purchasing freely now for fear of further advances, and certain parties claim to have information to the effect that prices will be pushed up quite a little higher. The London market has advanced a shade, and is quoted £17 10s. to-day.

**Spelter.**—After having declined to 4.15c. the market has stiffened up somewhat, and to-day the ruling quotation is 4.25c. to 4.30c., New York, and choice special brands are very firm, being held at 4.50c. Demand is very light, and the advance of yesterday is largely due to the fact that certain speculative interests commenced "taking hold." London has declined slightly and is quoted £19 2s. 6d.

**Antimony.**—There has been no change, Hallett's still being quoted at 9½c., and Cookson's 10¼c. to 11c.

**Nickel.**—Continues strong, but without change in price. It is still impossible to obtain large lots, and small lots command 55c. to 60c.

**Quicksilver.**—Wholesale lots of 100 flasks and more are quoted at \$51 per flask of 76½ lbs. London is unchanged at £9 10s.

**Tin Plate.**—A fair demand is reported, but there is no change as to price. The American Tin Plate Company quote on a basis of \$4.84 per box of Standard 100-lb. Cokes, New York delivery, or \$4.65 f.o.b. mill.

## Birmingham.

(By Telegraph.)

The coal miners' convention has formulated a scale of wages that is practically a demand for 20 per cent. increase. It makes the minimum price of mining coal 55 cents, with 65 cents as maximum. They also demand a pay day every two weeks and eight hours a day labor. Other demands are also made. Operators and miners are in consultation. Seven furnaces are banked. There is poor prospect for prompt agreement, as operators contend they are now paying all they can afford.

## Iron and Industrial Stocks.

The iron and steel stocks were again under pressure during the week, having been affected by reports of further reductions in prices of iron and steel. Quotations of stocks of some of the most conspicuous companies made new low records, touching figures which but a few weeks back would have seemed altogether unlikely.

|                                              | Bid. | Asked. |
|----------------------------------------------|------|--------|
| American Bicycle Company, Common.....        | 5    | 6      |
| American Bicycle Company, Preferred.....     | 29   | 33     |
| American Bicycle Company, Bonds.....         |      | 78     |
| E. W. Bliss, Common.....                     |      | 137½   |
| E. W. Bliss, Preferred.....                  | 125  |        |
| Diamond State Steel.....                     | 3¼   | 3½     |
| International Pump, Common.....              | 15   | 16½    |
| International Pump, Preferred.....           | 61   | 63     |
| Otis Elevator, Common.....                   | 27   | 28     |
| Otis Elevator, Preferred.....                | 86½  | 88     |
| U. S. Projectile.....                        | 95   | 100    |
| Tidewater Steel.....                         | 9    | 9½     |
| U. S. Cast Iron Pipe Company, Common.....    | 4½   | 5      |
| U. S. Cast Iron Pipe Company, Preferred..... | 38   | 39     |
| H. R. Worthington, Preferred.....            |      | 110    |
| Empire Steel, Common.....                    |      | 10     |
| Empire Steel, Preferred.....                 | 32   | 36     |

The Hall Signal Company have declared the quarterly dividend of 1 per cent.

The Amalgamated Copper Company have declared a 1½ per cent. regular quarterly dividend and a ½ per cent. extra dividend.

The earnings of the American Steel & Wire Company for May are reported to have been about \$800,000, making \$6,300,000 for the first five months of 1900.

At the annual meeting of the Bethlehem Steel Company, held in Philadelphia, the annual statement was presented for the year ending April 30, 1900. It shows net income from operations of \$1,672,000, which, after deducting the Bethlehem Iron Company's guaranteed dividend rental of \$450,000, shows about 7.63 per cent. on the \$16,000,000 Bethlehem steel stock. The company furthermore, out of gross earnings, spent \$595,000 for improvements and paid off \$1,000,000 floating debt. A dividend of \$600,000 was declared on the Bethlehem Steel Company stock and the profit and loss account shows a surplus of \$3,463,351, as compared with \$3,320,086 in 1899. The old directors were re-elected.

The Tennessee Coal, Iron & Railroad Company report for May:

|                           | 1900.       | 1899.     | Changes.         |
|---------------------------|-------------|-----------|------------------|
| Net Earnings.....         | \$332,868   | \$87,592  | Inc. \$245,276   |
| Charges .....             | 54,777      | 46,563    | Inc. 8,214       |
| Surplus.....              | \$278,091   | \$41,029  | Inc. \$237,062   |
| From January 1 to May 31: |             |           |                  |
| Net earnings.....         | \$1,606,062 | \$393,403 | Inc. \$1,212,659 |
| Charges .....             | 273,884     | 232,815   | Inc. 41,069      |
| Surplus.....              | \$1,332,178 | \$160,588 | Inc. \$1,171,590 |

The Michigan-Peninsular Car Company, now part of the American Car & Foundry Company, have declared a final dividend of \$555,000, being 11 1-10 per cent., covering all moneys now in the hands of the company after payment of all debts and liabilities, applying upon the dividends accumulated and unpaid on the preferred stock of the company, payable on and after June 29, at the office of the Guaranty Trust Company of New York, to the holders of the preferred stock upon the return and surrender of their certificates of stock indorsed in blank.

The Ironton, Ohio, Register states that the Kelly Nail & Iron Company of that place have decided to pay another semiannual dividend of 70 per cent. in July. This will make dividends amounting to 220 per cent. paid this year, 150 per cent. having been paid in January. The same paper states that the Marting Iron & Steel Company have not yet decided as to the amount of their semiannual dividend, but as 100 per cent. was declared at the January meeting, it is probable that the July dividend will be quite large.

### THE AMERICAN CAR & FOUNDRY COMPANY.

The annual meeting of the American Car & Foundry Company was held on the 21st inst. The following re-

## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING JUNE 27, 1900.

| Cap'l Issued. |                                       | Sales. | Thursday. | Friday.   | Saturday. | Monday. | Tuesday. | Wednesday. |
|---------------|---------------------------------------|--------|-----------|-----------|-----------|---------|----------|------------|
| \$29,000,000  | Am. Car & Foundry, Common...          | 4,456  | 133¼-14   | 133¼-147½ | -13½      | -13½    | 133¼-14  | 14 -14¼    |
| 29,000,000    | Am. Car & F'y, Pref. (7½ Non-Cu.)     | 8,584  | 60 -61    | 60 -60½   | 59½-60    | 57½-58¾ | 58 -60½  | .....      |
| 19,000,000    | Am. Steel Hoop, Common.....           | 7,170  | 17½-18    | -17¾      | 17½-17¾   | 17 -17¾ | 17 -18½  | 18½-18¾    |
| 14,000,000    | Am. Steel Hoop, Pref. (7½ Cu.)...     | 2,145  | 69 -69¾   | 66¼-69¾   | 66½-67    | 66 -67¾ | 66 -66¾  | .....      |
| 50,000,000    | Am. S. & W., Common.....              | 30,245 | 30¼-31¾   | 30¼-31¾   | 29½-30½   | 28½-30½ | 29¼-30½  | 29¾-30¾    |
| 40,000,000    | Am. S. & W., Pref. (7½ Cu.)...        | 7,285  | 71¼-72    | 70½-70¾   | 69½-70¾   | 69½-70¾ | 70 -70½  | 69¼-70     |
| 28,000,000    | Am. Tin Plate, Common, N. Y....       | 4,605  | 19 -19½   | 18½-19½   | 18 -18½   | 18 -18½ | 19 -20   | 19 -19½    |
| 18,325,000    | Am. Tin Plate, Pref., N. Y. (7½ Cu.)  | 3,662  | 73½-74    | -73       | -73       | 70¾-72  | -72      | 72 -73½    |
| 7,500,000     | Bethlehem Iron.....                   | 3      | .....     | .....     | .....     | .....   | -57      | .....      |
| 15,000,000    | Beth. Steel, Par \$50, \$1 paid in... | 1,455  | -15       | .....     | 15 -15½   | 14½-14¾ | 14 -15   | -14½       |
| 7,974,550     | Cambria Iron, Phila*.....             | 195    | -43¼      | -43¼      | .....     | 43 -43¼ | 43 -43¼  | .....      |
| 16,000,000    | Cambria Steel**.....                  | 9,571  | 14½-15½   | 15 -15½   | 15 -15½   | 15 -15½ | 15½-15¾  | 15½-15¾    |
| 11,000,000    | Col. Fuel and Iron.....               | 1,745  | -30½      | -30       | -30       | -29½    | 30 -31   | .....      |
| 46,484,300    | Federal Steel, Common.....            | 34,875 | 30¾-31½   | 30 -31½   | 29¾-30¾   | 28¾-30¾ | 29¼-30¾  | 30¼-31¼    |
| 53,253,500    | Federal Steel, Pref. (6½ Non-Cu.)     | 4,496  | 63¼-65    | 64 -65¾   | 64 -64¾   | 63 -64¾ | 60¾-62¾  | 62¼-62½    |
| 32,000,000    | National Steel, Common, N. Y....      | 9,535  | 24 -24½   | 23 -24    | 20 -22½   | 20½-21¾ | 21½-23   | 22½-23     |
| 27,000,000    | Nat'l Steel, Pref., N. Y. (7½ Cu.)    | 4,190  | -84½      | 83¼-84¼   | 82 -83¾   | 80¾-82  | 79¾-83   | -81        |
| 40,000,000    | National Stl. Tube, Common, N. Y.     | 3,120  | .....     | 42½-43½   | 41¾-42½   | 40¾-42  | 42 -43¼  | -42¾       |
| 40,000,000    | National Stl. Tube, Pref., N. Y....   | 2,034  | 88¼-88½   | -88½      | -88½      | 87½-88  | -88      | -88        |
| 5,000,000     | Penna., Common, Phila.....            | .....  | .....     | .....     | .....     | -58     | .....    | .....      |
| 1,500,000     | Penna., Pref., Phila.....             | 100    | .....     | .....     | .....     | .....   | .....    | .....      |
| 12,500,000    | Pressed Steel, Common.....            | 3,470  | 42½-44    | -44       | 43½-43¾   | 42 -43¾ | 42½-43½  | 42½-43¾    |
| 12,500,000    | Pressed Steel, Pref. (7½ Non-Cu.)     | 300    | .....     | -72       | .....     | 72 -73¾ | 72 -73¾  | .....      |
| 27,352,000    | Republic Iron & Steel, Common...      | 4,950  | 9½-10¼    | 9½-10¼    | -9¼       | 8¾-9¼   | 9 -10½   | 10 -10½    |
| 20,852,000    | Repub. Iron & Steel, Pref. (7½ Cu.)   | 2,638  | -50       | .....     | 50 -50½   | 49½-51  | 51 -52¾  | 50½-52½    |
| 7,500,000     | Sloss-Sheffield S. & I., Common..     | 200    | .....     | .....     | .....     | .....   | 19½-20½  | .....      |
| 6,700,000     | Sloss-Sheffield S. & I., Pref.....    | 454    | -60¼      | -60¼      | -60¼      | 60 -60¼ | 60 -60¼  | .....      |
| 20,000,000    | Tennessee Coal and Iron.....          | 22,609 | 63 -64¼   | 64 -65    | 63½-64    | 62¾-64  | 62 -64   | 63½-66     |
| 1,500,000     | Warwick Iron & Steel (par \$10)...    | 100    | .....     | .....     | .....     | .....   | .....    | -8         |

\* Par \$50. \*\* \$9 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

**Bonded indebtedness:** Am. S. & W., \$130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$13,200,000 Illinois 5%, \$7,417,000 E. J. E. R. 5%, \$1,800,000 Johnson 6%, \$5,732,000 D. & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,561,000 6%; National Tube, none; Tennessee C. I. & R. R. Co., \$5,367,000 6%, \$1,114,000 7%, \$1,000,000 7½ cu. pref.; Pennsylvania Steel, \$1,000,000 5%, Steelton, 1st, 1917, \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$890,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock with accumulated dividends of \$640,000 to June 30, 1899.

port was submitted for the 14 months ended April 30, 1900:

|                                                                |             |
|----------------------------------------------------------------|-------------|
| Earnings from all sources.....                                 | \$6,831,599 |
| Renewals, replacements, repairs, new patterns, flasks, &c..... | 802,086     |
| Net earnings.....                                              | \$6,029,513 |
| New construction charged off.....                              | 294,564     |
| Total net earnings.....                                        | \$5,734,949 |
| Dividends (7 per cent.).....                                   | 2,036,300   |
| Surplus.....                                                   | \$3,698,619 |

The general balance sheet as of April 30 shows:

|                                                                  |              |
|------------------------------------------------------------------|--------------|
| <b>Assets—</b>                                                   |              |
| Cost of properties and plants.....                               | \$52,862,166 |
| Add cash expended for properties acquired during the period..... | 350,000      |
|                                                                  | \$53,212,166 |
| <b>Materials on hand:</b>                                        |              |
| Bar iron, pig iron and miscellaneous supplies.....               | \$6,472,997  |
| Timber and lumber.....                                           | 2,098,076    |
|                                                                  | 8,571,073    |
| Accounts receivable.....                                         | 6,448,489    |
| Cash in banks and on hand.....                                   | 913,558      |
| Total.....                                                       | \$69,145,286 |
| <b>Liabilities—</b>                                              |              |
| Preferred capital stock.....                                     | \$30,000,000 |
| Less unissued.....                                               | 910,000      |
|                                                                  | \$29,090,000 |
| Common capital stock.....                                        | 30,000,000   |
| Less unissued.....                                               | 910,000      |
|                                                                  | 29,090,000   |
| Audited vouchers for material not yet due and notes payable..... | 6,956,480    |
| Pay rolls (paid May 10, 1900).....                               | 310,157      |
| Surplus account.....                                             | 3,698,649    |
| Total.....                                                       | \$69,145,286 |

The net earnings of the 12 months ended February 28 applicable to dividends were reported some time ago at \$4,085,951. Consequently it appears that the net earnings in March and April were about \$1,600,000.

The following directors were elected: William McMillan, W. K. Bixby, F. H. Eaton, George Coppel, J. B. Haggin, George H. Russell, W. J. McBride, E. F. Carry, J. L. Smyser, George Hargraves, C. R. Woodin, L. J. Cox, W. M. McMillan, F. E. Canda, S. S. De Lane, Lenox Smith, W. G. Weller, W. F. Lowry, D. A. Bixby and William M. Hager. The retiring directors are E. N. Dickerson, H. B. Denker and Anthony Gref. The number of directors has been increased from 13 to 20.

Perkins Machine Company, Boston, Mass., manufacturers of power presses and shapers, have appointed Selig Sonenthal & Co., London, England, agents for the Perkins' noiseless adjustable friction shaper for Great Britain and France. Their agents for the other countries of Europe are De Fries Company, Akt. Ges., Dusseldorf, Germany.

## The New York Machinery Market.

Office of The Iron Age, 232-238 William street, New York. June 27, 1900.

One of the parties interested in the Niles-Bement-Pond-Pratt & Whitney consolidation stated last evening that the amalgamation has been practically effected. Both the Niles-Bement-Pond interests and the parties controlling the majority of the stock of the Pratt & Whitney Company are in favor of a plan which makes the transaction practicable. While both parties have consented to this plan its formal ratification has not yet been given by them. This is accounted for by the fact that the attorneys are now settling over certain technical points of the contract which it is thought will be formally signed within the next few days. It is provided by the plan adopted that holders of the preferred stock of the Pratt & Whitney Company shall receive an amount of new 6 per cent. cumulative preferred stock equivalent to 70 per cent. of their holdings. This newly issued preferred stock will stand on an equal basis with the preferred stock of the Niles-Bement-Pond Company. The earnings of the new Pratt & Whitney Company will, of course, be first applied to the dividends on the new preferred stock. If, however, in any event these earnings should not prove sufficient to pay the preferred dividends, the deficiency is guaranteed by the Niles-Bement-Pond Company. The remaining 30 per cent. of the present Pratt & Whitney preferred stock is exchangeable for common stock, and under the plan is to be purchased by the Niles-Bement-Pond Company at \$10 per share. The present outstanding \$1,000,000 of Pratt & Whitney common stock will also be purchased by the Niles-Bement-Pond Company at the price of \$10 per share. The latter company also reserve the right to purchase the preferred shares within ten years at par.

At present the Pratt & Whitney Company have outstanding \$1,750,000 of preferred stock, which is an 8 per cent. cumulative issue, and \$1,000,000 of common stock. It will therefore be observed that the result of the present negotiations will be to reduce the preferred stock to \$1,225,000 and increase the common stock to \$1,525,000. The purchase of the latter would give the control of the company to the Niles-Bement-Pond Company.

In general market conditions there is no change.



Business is almost entirely made up of small orders, but at the same time the inquiry is still of sufficient volume to indicate that there would be an excellent amount of good orders if the prospective purchasers could be satisfied with the condition of the market. Business in fine tools, cutters, twist drills, &c., is said to be rather heavy at present, indicating that manufacturers are replenishing their tool room stocks.

A good sized cable order has been received from V. Lowener of Copenhagen. A good deal of business has reached this country from Denmark and Sweden lately, and, judging from present indications, an excellent field will be developed in these countries. Since the completion of an extensive railroad system, the countries have been placed in a position to foster large manufacturing establishments and it is quite evident that certain energetic individuals are working toward the establishment of several new plants which will add a new phase to the Swedish iron and steel industry. The native steel workers have awakened to the realization of the fact that quantities of Swedish steel are exported to this and other countries to be manufactured into articles which are imported into Sweden, Denmark and other European countries. Their intention is to build numerous large manufacturing plants in Denmark and Sweden and instead of exporting the steel, send out the finished product. That we may soon see developments in this line is to be gathered from the fact that a number of engineers have just returned to the peninsula countries, having spent several months studying machine shop and engineering practices of this country. Daniel Schmidt, who is one of the engineers for V. Lowener, has just returned to Copenhagen after having spent nine months in the shops of the Brown & Sharpe Mfg. Company, the Pratt & Whitney Company, the Niles Tool Works Company and other large establishments. O. E. Jorjensen, who represents Burmeister & Wain, large engine builders of Copenhagen, is at present at the works of the De La Vergne Refrigerating & Machine Company. We are informed that he will superintend the construction of an addition to the Burmeister & Wain plant, at which refrigerating and ice making machinery will be built.

Magnus Rubens of Sweden is now making a tour of American machine shops learning the making of American machine tools. He is at present at the works of the Niles Tool Works Company. He intends building an automobile plant in Sweden. We learn that there is a project on foot for the establishment of an armor plate plant and plate mill at Stockholm. It is also said that a plant is to be built for the manufacture of steel shafting and power transmitting machinery.

Graham Brothers of Stockholm have just ordered \$10,000 worth of conveying machinery from the American Hoisting & Derrick Company of St. Paul, Minn., and 26 Cortlandt street, New York.

It is reported that an entire new system of shops are to be built at Reading, Pa., by the Philadelphia & Reading Railroad. There will be included in the work a machine shop, erecting shop, foundry, boiler shop, blacksmith and forge shop and central power station. The machine and erecting shops have just been started, and the main building is to be 750 x 200 feet. Several powerful electric cranes will be placed in this shop to be used for lifting locomotives and placing them on certain tracks. The main building is to have a center aisle 60 feet in width and two bays, each to be 70 feet wide. Each of the latter will contain two traveling cranes, one placed above the other. The upper cranes are to be of 120 tons capacity, while the lower ones will carry 35 tons. A 10-ton crane will span the 60 foot center aisle. The boiler shop will be an extension to one of the 70 foot bays, the crane tracks extending into it. The buildings will be heated and ventilated by an elaborate electric fan system.

Facts have come to light regarding the new plant which will be located at Bridgeport, Conn., by the Locomobile Company of America. We are advised that this company have purchased a large tract of land on the water front at Bridgeport on which they will build an entire new factory system. The numerous scattered plants of the company will be concentrated at this point. The new plant will have a capacity much greater than that of the plants which they control at present. This will necessitate the purchase of additional machinery. The contract for the new buildings has been awarded to the Berlin Iron Bridge Company of East Berlin, Conn. The company now control a plant at Westboro, Mass., two plants at Worcester, Mass., and one at Bridgeport, Conn. The Westboro plant was formerly occupied by the Humber Bicycle Company, Limited. It is used for doing the principal machine work, including the building of the motors. The Bridgeport plant is the old Liberty Cycle shop, at which the vehicles are assembled and shipped. One of the Worcester plants was formerly occupied by the J. C. Spears Mfg. Company. The other is a new one. Both are used exclusively for the production

of drop forgings. The company are receiving orders far beyond their present productive capacity.

Westinghouse, Church, Kerr & Co. have been awarded a contract for an additional equipment of Roney stokers from the Metropolitan Traction Company. The stokers will be applied to the third tier of boilers in the new Ninety-sixth street power station. These boilers will produce about 11,000 horse-power. Roney stokers will also be supplied for the balance of the boiler house.

The Fuel Economizer Company, of 74 Cortlandt street and Matteawan, N. Y., have just received orders for supplying the 1000 horse-power of mechanical stokers for the Philadelphia United States Mint. Babcock & Wilcox have received the order for the boilers. The Fuel Economizer Company have also been awarded contracts for 1500 horse-power of economizers from the Harrisburg Steam Heat & Power Company of Harrisburg, Pa., and 1500 horse-power from the Edison Portland Cement Company. They received an order for 1000 horse-power from Mellor & Rittenhouse of Philadelphia, whose new plant will be located at Camden, N. J. The order for the boilers for the last named plant has been awarded to the Coatesville Boiler Works.

The Coatesville Boiler Works of 141 Broadway, N. Y., have just received orders for two 1000 horse-power boiler plants, one of which is to go to a new saw mill plant in North Carolina and the other to a pumping station near Buffalo. They have also received an order for upward of 700 tons of steel cylinder work for caissons to be sunk for foundations for an office building.

L. J. B. Wall of the engineering and contracting firm of Splatt, Wall & Co., of Perth, Australia, arrived in this country last week. He is stopping at the Broadway Central Hotel. Mr. Wall will secure plans, specifications, catalogues and similar data of American machinery, engines, generators and boilers. He will also purchase a quantity of material for the equipment of electric lighting and power stations.

Reuter Brockelman & Co. of Shanghai have purchased from the Stillwell-Bierce & Smith-Vaile Company of 141 Broadway six large duplex marine pumps. They were ordered through C. Von Pustau & Co., of 100 William street, New York.

Three lots of bids will be opened at the Navy Department, Washington, D. C., on July 3. One lot, which is for the League Island yard, will consist of a quantity of machine tools, boilers, condenser, generating set, motors, air compressor and receiver, voltmeter, testing set, electro plating outfit, leather belting, shafting, pulleys, tools, drills and files.

For the Boston Navy Yard a quantity of machine tools will also be required, together with coal and miscellaneous supplies. Machine tools constitute the requirements for the Portsmouth, N. H., Navy Yard. Blank proposals for each set of supplies can be obtained from A. S. Kenny, Paymaster General, U. S. Navy, Washington, D. C.

Westinghouse, Church, Kerr & Co. have been awarded the contract for the tanks, condenser, pumps, &c., for the Ellis Island Immigrant Station.

A press dispatch from Chicago, dated June 27, states that at 2.15 o'clock that morning the Bricklayers' Union withdrew from the Building Trades Council. It is said that this makes the practical ending of the strike that has been in progress for months, tying up building operations in Chicago, and keeping many thousands of men idle. As a result of the bricklayers' action, it is now only a question of hours when the 50,000 workmen who have been idle for many months will be arranging for their return to work. The Bricklayers' Union was the strongest labor organization in the Building Trades Council.

The Board on Naval Construction, at Washington, have decided to recommend to the Navy Department the purchase of the submarine torpedo boat known as the "Improved Holland," the disposition of which was left open by Secretary Long when he bought the "Holland." This order has no effect upon the previous action of the Department in deciding to build the five submarine boats provided for in the last act of Congress.

Bituminous coal is mined in 28 counties in Pennsylvania, and anthracite in ten counties, and in the 38 there were mined in 1899 127,101,167 tons. Of this 54,034,224 tons were produced from 366 mines in the anthracite region and 73,066,945 tons from 776 mines in the bituminous region.

Alex. E. Brown, president of the Brown Hoisting & Conveying Machine Company of Cleveland and New York, sailed last week for an extended European tour.

H. S. Manning of Manning, Maxwell & Moore has sailed for a trip through Europe.

## The Cincinnati Machinery Market.

Office of *The Iron Age*, Pickering Building, }  
CINCINNATI, OHIO, June 23, 1900. }

A careful review of conditions as they exist to-day in iron circles seems to prove that there is no cause for real alarm in any branch of the trade. That there is a very material reaction in some lines from the boom conditions of 1899 is certain, but there is no indication of an immediate return of extreme dullness. The average condition of the various departments is undoubtedly above past averages, and when the present uncertainty in regard to raw materials has passed away and trade has found a basis on which to make calculations, it will be found that the cry of "Wolf! Wolf!" was not only an unnecessary but an unfounded alarm. Pig iron values have settled about \$4 from the high water mark, and buyers are showing signs that they regard the bottom not far off. Inquiry in almost every department of the trade is more brisk than it was a month ago, and there is a settled feeling that just as soon as pig iron has begun to move again business will again be brisk. The great majority of iron working shops are still as they have been, very busy. Machine tool makers started in the year with orders ahead sufficient to run their shops for four to six months, and this surplus, together with the fair current receipts, insures an excellent year's business to all. On the whole it seems certain that the dullness is at least imaginary in part, and is only real in comparison with the conditions of 1899. Another factor to be considered in estimating the real condition is that the machine tool producing capacity of Cincinnati is at the lowest calculation 50 per cent. greater than it was in 1898, and with the capacity of then the trade of to-day would be considered very heavy.

One of the most important enterprises which the past month has seen put under way is the commencing by the Lunkenheimer Brass Works of their long projected shops in Fairmount, this city. Work has been begun on a brick and iron structure 90 x 171 feet in size and three stories in height, which is to be used by the company for the manufacture of automobiles and for their iron valve department. The brass working business is to be kept for the present year at the old location on Eighth street. It is proposed to continue the erection of the new plant, and within a year and a half to be entirely settled in the new quarters. The manufacture of automobiles is a new business which the company have decided to enter on a very generous scale. They have been experimenting for some time in this line, and are now convinced that they have a good thing and propose to push it for all it is worth. The motive power will be gasoline, and the designs and patterns are already ready for use. The new shop will be in running shape by October 1 at the latest. The erection of this shop has been delayed for some time on account of the high prices for building material, and the fact of contracts having been let shows that the company consider the present values as reasonable. The company say that judging from their own trade the general condition of all the affiliated lines must be very fair.

The National Machine Tool Company is the style of one of the very latest corporations to start business in this city. They are located at 208 and 212 Lawrence street, and are engaged in the manufacture of a feeding and screw cutting attachment for engine lathes. The company are under the management of W. L. Schellenbach, the patentee of the device which they are to manufacture. He is quite well known in local machine circles, and was formerly in the employ of the Lodge & Shipley Machine Tool Company.

Business in architectural iron circles was never better than it is at this time and all the local shops are exceedingly active. The L. Schraiber & Sons Company have been so fortunate as to secure the contract for the American Rolling Mill Company's plant at Middletown, Ohio. There are four buildings included in this contract. The mill building, boiler house and retort house are just under way and will be ready to turn over to the owners by September 1 next. The job will use about 1000 tons of structural material. Among other contracts which this company have are those for the Lunkenheimer shops in this city; a large stock house for the Cook Brewing Company at Evansville, Ind. They have also secured large contracts for ornamental iron work for the Custom House at Norfolk, Va., and for a large public school building at Pittsburgh, Pa. Business with the company is away ahead of any season they ever worked through, and up to June 1 this year they have booked more orders than is usual for an entire average year. The outlook is excellent, and 1900 promises to be the banner year.

The Stewart Architectural Iron Company are also very busy, and the management say that this will be a big year with them. They are now running full time with 220 men, and orders keep coming in almost beyond

their ability to handle them. One of the most important contracts on hand at this time is that for all the iron and steel work for the jail and penitentiary at Syracuse, N. Y., which includes over 300 steel cages. They have also the jail contracts for Greensboro, N. C., and Newport, Ky. They have also structural contracts for four cotton mills in the South; the Court House, Iowa City, Iowa, and the City Hall, Covington, Ky. For the Sorg paper mills at Middletown, Ohio, they are building a smokestack 175 feet high by 12 feet in diameter. This stack is to be steel shell with fire brick lining. The mill is a new one, being started by Phil J. Sorg, the well-known tobacco magnate and politician, of that town.

The Stewart Company are also very much crowded in their fence department.

The I. & E. Greenwald Company are a concern which by reason of their specialty—namely, gears, are usually considered a very good trade barometer; and just at present if their experience is to be counted as an index, the manufacturing interests of the country are certainly in a flourishing condition. The call for gears is very well distributed throughout North America and represents a well diversified classification of interests. Among recent orders are some for some unusually large gears. Several, which have just been shipped to Canada, were 16 feet in diameter. They are now at work on one 5 feet in diameter with 6¼-inch pitch and weighing 4 tons, which is representative of unusual high power machinery and goes to a manufacturing establishment in Indiana. They have been having a big call for their Brown patent automatic cut off engines, and are just finishing one 20 x 42 in size for the Maysville, Ky., Gas Company. Also two about the same size for buyers near Reading, Pa. They have also been doing a large amount of work in powder mill machinery, one contract for which is now in process for the Marlon Powder Company, at Goes Station, Ohio. They have also secured several large contracts for coal washing machinery, one of which goes to Rookwood, Ala. Another calling for \$21,000 for the same class came in from Illinois on the 14th of the present month. Among the good local orders recently taken was one from the Eagle White Lead Company for \$15,000 worth of machinery for the large addition they are now making to their present factory. The outlook for the remainder of 1900 is good.

The Lane & Bodley Company received an order a few days ago for a 26-inch cylinder air compressing engine from the Waltham Watch Company. They shipped from their shops a few days ago one of the largest air compressing engines they ever turned out to South Africa. It was loaded on a vessel at New York this week. It was their first order from the Boer gold fields. General trade has been fair without many special features. Inquiry for new work has dropped off somewhat the past few weeks.

The J. A. Fay & Egan Company are now working on some big contracts recently received from the United States Government for tools to be delivered at the Mare Island, Cal., and Brooklyn Navy Yards. President T. P. Egan, of the company, sailed for Paris a short time ago, and a cablegram just received announces his safe arrival. The company say that their show at the Paris Exposition is already beginning to tell in new business, and that quite a number of good orders have been received as a result of their exhibit. Saw mill trade in Alabama and Mississippi is quite active just at present. The special feature of their business just now, however, is the success they are having with their sanders. The competition on this line of business comes mainly from the East, and it is because of the large number they have sold right in the enemy's country that the company are in such good spirits over the matter.

M. L. Andrew & Co. have just shipped two of their largest multiple boring machines to Dublin, Ireland, and are now at work on a special machine for Oregon. They have also taken a large order for Springfield, Ohio. General trade is quite fair; the inquiry is good and promises good things for the remainder of this year.

John Steptoe & Co., makers of shapers, report new business as fair, but not equal to the rush of last year, when they piled up such a quantity of orders that they have not as yet been able to dispose of all of them.

The Belmer-Eames Machine Tool Company, who have been preparing to start in business for the past six months, are now getting pretty well on toward the initial point. At first they contemplated making lathes, but this has been abandoned and they will devote their energies to all sizes of planers. They have been much delayed by lack of skilled workmen and in securing their necessary shop equipment. They are now building a large planer for their own use, and will soon be all ready for the start.

The Wm. E. Gang Machine Tool Company report business as quieter than it was last year, yet still fairly good with inquiry considerably better than resultant orders.



The Knecht Bros. Company report the inquiry for their sensitive drills as very good, but trade is not at all brisk. Buyers seem to be holding off from some cause or other. The past few weeks there has been quite a little spurt of orders from Europe. They just shipped one lot of four cases to Germany.

The Cincinnati Screw & Tap Company, whose trade is entirely domestic, are regarded as one of the best trade barometers in this city. Their product goes to all classes of iron working shops. They say that trade has been quiet, but that lately it has picked up quite a little and is now good. Orders from agricultural implement works are very good, as they are also from the special machine shops. Machine tool works have been quiet, but lately are showing more activity. Engine builders also appear to be a little dull just at present.

The Wm. Powell Company report a most excellent trade in their brass fittings with the Russian Government, and also say that their shipments to China are increasing constantly. Just now, owing to the political complication, they are holding back several large shipments for Shanghai awaiting advice from their representatives as to whether it is advisable to ship or not.

The published report of the Barney & Smith Car Company of Dayton, Ohio, is one of the best showings that that concern ever made. The net earnings for the past year were about \$400,000, and after paying \$34,000 for new buildings and paying interest on bonds and dividends on preferred stock, they placed \$175,000 to the surplus fund. They are now doing \$400,000 of business per month.

## The Philadelphia Machinery Market.

Office of *The Iron Age*, Forrest Building, Philadelphia, Pa., June 27, 1900.

The conditions at present prevailing in the local machinery market are as a whole fairly satisfactory. A majority of shops have sufficient work on hand to keep them busy for several months, and bookings of desirable orders are by no means unfrequent. It must be admitted, however, that the market is quieter than for some time past. The hurly-burly rush is gone, but in its place there is a condition of subdued activity; and while the slackening up is perhaps regretted among the smaller shops (which in many instances make a good thing from handling the overflow of the larger concerns) the majority of houses are doubtless glad of a breathing spell, so long as the lull in trade does not mean a period of actual dullness.

Possibly a reason for the slackening up of the demand may be found in the fact that the unsettled condition of prices is the means of holding back some orders, and that as soon as there appears to be a probability that prices will hold their own, these orders may be placed. "A waiting market" is the term applied to the situation by a well known machine tool maker, and doubtless this brief phrase about covers the situation.

Many of the largest concerns in the trade when asked as to what they are doing reply that they are as busy as it is desirable to be, but decline to give any specific information as to the character of the work on hand, or the destination of finished material. Possibly through this policy of silence the knowledge of many large orders both for home and abroad is kept from becoming public property.

The Link-Belt Engineering Company state that they find business in their line of manufactures very active. They report a good volume of trade in Cuba and the West Indies, shipments of conveying machinery and elevators to these points being quite heavy. The concern state further that the outlook for a continuance of present conditions seems most favorable, and as far as they are concerned the future is not worrying them. A new building 40 x 70 feet is being built adjoining the present office of the company, to be used as drafting rooms when completed.

Geo. V. Cresson Company report a good demand for their products with a fair number of inquiries and bookings sufficient to prolong present conditions for some time. A considerable trade is done by this house in furnishing complete shafting outfits for textile mills. June shipments of this character include shafting for cotton mills in Mexico, and a Philadelphia jute mill, and a large consignment of same machinery to go to a woolen mill in China. A Southern snuff factory and a Southern cotton seed oil mill are also to be equipped with shafting outfits and special machinery by the Cresson Company. Among other June shipments of this firm are a rope drive for a Pennsylvania coal breaker, dredging machinery to Galveston, Texas; crushing and grinding machinery for Pennsylvania cement plants, and a set of ore crushers to iron mines in New Jersey.

Goodell & Waters state that they are busy in the various lines of wood working machinery which they manufacture, but make no mention of any specific shipments.

The Energy Mfg. Company say that the demand for their elevators and lifts is very satisfactory and that they are rushed to their fullest capacity. Much of this firm's product goes into large warehouses in the South, where great strength and capacity are requisite in the hoisting apparatus, and the Western States are also big buyers of the concern's output; a very large order for freight elevators for a firm on the Pacific Coast is now being filled. June shipments will also include freight elevators to several points in Louisiana.

Nazle & Bassett, engineers and machinists, report a good volume of trade, especially in their gear cutting department. They are turning out a considerable number of rawhide gears for the trade. Among other work on hand may be mentioned a miscellaneous lot of special machinery for a number of local concerns. A California paper novelty manufacturing concern have recently placed an order for a crimping machine for making what is known as crepe paper. Nazle & Bassett are making a specialty of manufacturing gasoline engines for automobiles, and state that they have several of the engines under way on an order from a large horseless vehicle concern, and that this department promises to become a prominent part of their business.

The Philadelphia Machine Tool Company have taken up a new line of manufacture, that of testing machines. They state that although this is but a recently added department, they are fully equipped with all modern appliances for this class of work. Jos. W. Bramwell, formerly superintendent for Rieble Brothers, has charge of the new department. Several good sized orders have already been booked for testing machines, in addition to which the firm report an excellent demand for their other products.

Chambers Bros. Company report a prosperous condition, considerable work being on hand. This concern find a big market in the South for their brick making machines, the manufacture of which they make a specialty. They state that there is a considerable market for these machines in Cuba, and a number of bookings from that territory are on hand. Trade is brisk in their various other lines.

Dienelt & Eisenhardt say the demand for their dead-stroke power hammers and hydraulic jacks was never as large as at present. The majority of the call for these articles is from the home market, although quite a few find their way into foreign markets. This house continue busy on foreign orders for presses for printing patterns on oilcloth.

Israel H. Johnson, Jr., & Co., lathe builders, report a good demand for their product, shipments for this month comprising many small lots to various adjacent points. Work on the new erecting shops now being constructed for this firm is progressing rapidly, the iron work being all in place, and the rear walls are being put up. Another month should see the new buildings under cover, and about ready for installation of cranes.

The Pennsylvania Machinery Company, Bourse Building, are booking some nice orders and have lately been bidders for large plants. They say there is little if any slackening up in their trade, and that as a whole the outlook is excellent.

W. E. Shipley reports sale of ten outfits of the Reeves variable counter shafting during the month, the outfits going to Reading, Lancaster and other Pennsylvania points. The various other lines of metal working machinery handled by Mr. Shipley make a good showing for the month.

The Baldwin Locomotive Works report a continuance of brisk trade and say there is not the least falling off in the demand for their locomotives, and that their foreign trade is steadily on the increase, and the works are running to their fullest capacity. They will ship this month via steamer "Luvstakken," 20 locomotives for the Paris & Orleans Railway of France, thus completing the order of that company. Sixteen locomotives of the compound type will also be shipped this month to the Chicago, Rock Island & Pacific Railroad Company.

The Baldwin Company are making extensive alterations to the center shop facing on Broad street from Buttonwood street South, a six story steel frame work now being erected, and the present three story shop is to be altered into a modern six story building, the additional room of which will greatly relieve the present congested condition of the works.

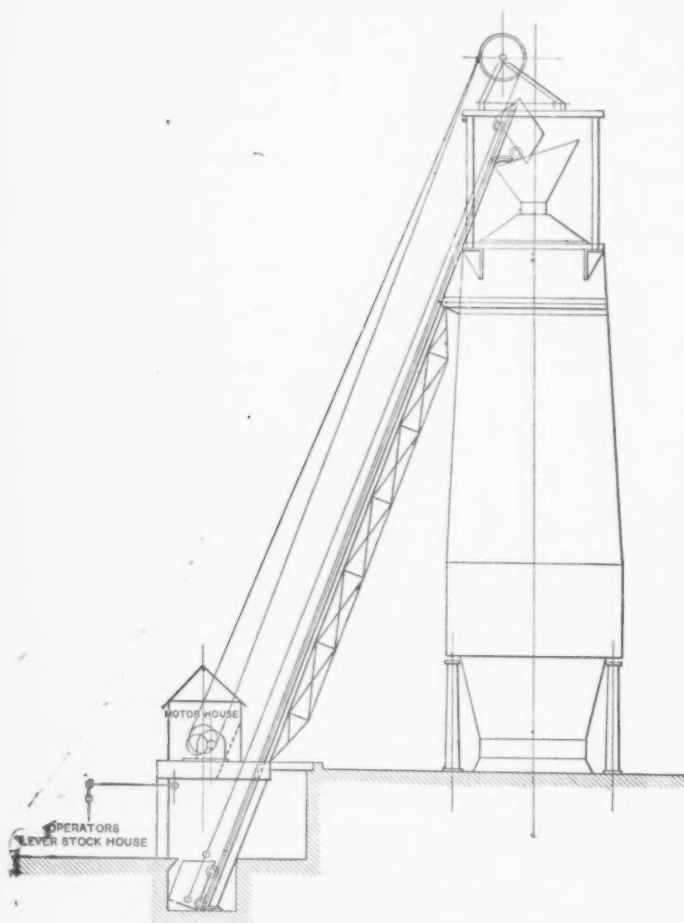
Main Belting Company report a steady, even business all the time, and for some time past the demand has taxed their fullest capacity. Important additions to the plant have been made, and have to be made from time to time so as to enable them to meet the demand which is one of steady growth year by year.

The officers of the American Tin Plate Company will have a conference on Thursday of this week at their offices in New York with representatives of the Amalgamated Association, to endeavor to effect an agreement on the wages scale for the year beginning July 1.

## The Advantages of Electric Furnace Hoists.

BY ANDREW ELLICOTT MACCOUN, BRADDOCK, PA.

In the large blast furnace plants of to-day electricity is gradually taking a very important part in the economical operation of all labor saving devices for handling the raw materials, such as ore, coke and limestone. This is largely due to the great convenience and economy in transmitting power, the ease and convenience of control, and the great economy over steam engines effected by its use. There are now used at modern blast furnaces large electric cranes for handling all the raw materials, and these do it in the cheapest possible way, and by the use of such machinery the labor for handling these materials has been reduced to such an extent that it is surprising to see how few men are required in the stock yards of such furnaces. In a similar way electrical hoists are coming in use for hoisting the raw materials to large furnaces. These, with modern skip equipments, save top



### THE ADVANTAGES OF ELECTRIC FURNACE HOISTS.

fillers on the furnaces and also are greatly more economical than when steam engines are used for this purpose. I wish to enumerate a few of the advantages gained by the use of these hoists, and to give a few figures taken from actual tests of some of them, which will show plainly the savings effected.

The skip equipments are made very much larger than the old style arrangements, lifting from 5 to 10 tons. With large furnaces this is very important, for at times when a furnace is running badly it is necessary to fill it quickly, thus not allowing the burden to get very far out of reach. When the older style elevators are used, which only take up two barrows at a time, it requires a long while to fill a furnace that is out of reach. A furnace always works better when such irregularities are avoided. Of course, electrical hoists are used only where economical and reliable power plants are located; but in nearly all modern furnace plants this is the case, as electricity has now to be used to so great an extent in handling the raw materials.

The old style hoisting engine is very wasteful in the use of steam, consuming when running about 150 pounds of steam per horse-power hour. Automatic cut off engines have been repeatedly tried in many places on furnace hoists, but in all cases they were failures, and had

to be replaced by the old style engine, as the automatic cut off engines could not make the exact stops required for work of that kind. Then in addition to the steam consumption of the steam hoisting engines there is always a great loss due to condensation going on in the long steam lines running to the hoists and in the exposed valve chests of the engine, which in 24 hours amounts to considerable, as the engine stands idle at spells for quite a time. There is also a quantity of cylinder and engine oil required, as well as packing, crank and cross head brasses to attend to, &c., and these items amount to a great deal in a year and give more or less trouble.

Electric furnace hoists have self oiling bearings and require very little attention.

The first of these hoists was started at the Edgar Thomson Works of the Carnegie Steel Company, in March, 1898. Four more have been added since that time, and the Otis Elevator Company are now building many such hoists for other furnace plants. The general arrangement is shown in the accompanying illustration. From actual tests the average efficiency between the theoretical mechanical horse-power required to lift the material and the electrical horse-power taken by the motor is about 61 per cent. with all load variations, and it must be remembered that these variations are from about 1 ton when coke is hoisted to about 5 tons when ore and limestone are hoisted. This efficiency takes into account all losses in motor, gearing, friction of skips on tracks, &c., and the efficiency given is the average for all the different loads. In addition to the above the average wattmeter readings were taken for a week on a line on which there were three furnaces, the wattmeter having been calibrated before the test was made and found to be correct. Two of the above furnaces were identical in size, the third being smaller.

The average horse-power used through the above period was 48.

The estimated horse-power taken by the smaller furnace was 11.

The average horse-power taken by each of the larger furnaces was 18.5.

The approximate amount lifted to one of the larger furnaces in a week is 10,000 tons of raw material.

The average theoretical horse-power required to lift the above material during the given time is 91.

The approximate efficiency between the power used at the switch board and at the power house and the theoretical power required is 50 per cent.

This efficiency takes into account all losses in lines, motors, gearing, friction of ropes, drums, sheaves, &c., friction of skips on tracks, and also extra trips when no loads are lifted and movements made for lifting scrap. This is done if an electrical horse-power at switch board is generated for 20 pounds of steam per horse-power hour. Taking all losses into consideration, it takes 40 pounds of steam per horse-power hour to do the actual lifting.

The steam hoisting engine takes 150 pounds per horse-power hour at the engine. This does not take into account any of the losses before mentioned in the machinery, caused by friction, &c., or the condensation in pipes and valve chests, and it can thus be readily seen that the electrical hoist does not take one-fifth the amount of power to operate it. This is estimating the losses in engine as very small.

If the value of an electrical horse-power for a year at the switch board is placed at \$50, the approximate cost of power alone for one year on one of the larger furnaces would be \$925. The cost of lifting 100 tons of material 135 feet would be 17½ cents. The cost of lifting 1 ton of material the above height would be approximately 1-6 cent. There are very few steam hoists that do this lifting for 1 cent a ton. This shows plainly the economy in using such hoists, not counting the savings in labor.

The autumn meeting of the Iron and Steel Institute of Great Britain will be held at Paris under the auspices of the *Société d'Encouragement pour l'Industrie Nationale*, on Tuesday and Wednesday, September 18 and 19, 1900. Henry Chapman, who was honorary secretary at the meetings of the institute in Paris in 1878 and 1889, has placed his office, 10 Rue Lafitte, at the disposal of the institute. Arrangements will be made for visiting the different sections of metallurgy, mining, machinery and railway plant at the exhibition, and Henri de Wendel, Bessemer gold medalist, has intimated his intention to invite a limited number of the members to visit the works of his firm, at Joeuf and Hayange, after the meeting.

The New York State Railroad Commissioners have granted permission to the Racquette Lake Railroad Company, recently incorporated, to use steam generated from oil in the operation of their road running 19 miles through a thickly wooded section of the Adirondacks.



# HARDWARE.

## Condition of Trade.

WITH the approach of the end of the half year and the beginning of the vacation season trade is becoming more inactive and something of a midsummer dullness is observable. Apart from the influences above indicated, the condition of the market is much affected by the continued weakness in Iron and the steady development of lower prices. This, as we have pointed out, is a natural reaction from the course of the market during the past year, and it is probably a matter for congratulation that the descent to a normal basis is so decided that if continued for a little while longer a level will be reached which will justify confidence that further declines are not to be apprehended. In this state of things the trade are naturally buying sparingly, the principal effort of the jobbers being to dispose of goods on hand. This process of unloading has been going on satisfactorily for several months and stocks are beginning to assume smaller proportions than some time ago, but there are still a good many high priced goods in their hands. Prices on these are naturally yielding in accordance with the reductions which have taken place on many lines, and the process of cutting prices is carried to such an extent that the manufacturers are frequently undersold. This is a natural result of the trade having stocks of low priced goods, and is not to be deprecated, as it is probably necessary for the jobbers for their own protection to pursue this course. Manufacturers, however, do not relish being obliged to compete with their own goods, and have in some instances deemed it advisable to reduce their prices in order to keep in the market. It will be seen in the following columns that a number of further reductions are announced. With the revision of prices which will naturally take place early in July further changes may be anticipated. Some manufacturers will doubtless follow those who deem it advisable to maintain prices and refuse to fall in with the prevailing tendency toward lower values. The fact that on many goods the lower cost of raw material makes little difference in the cost of the finished article is a consideration which is referred to as justifying the maintenance of existing prices, and has much force in cases where there was not a radical advance in sympathy with the upward movement of Iron. Many manufacturers also have relatively high priced raw material on hand or under contract, so that their cost on goods is greater than if they were to buy under present conditions. The developments of the next few weeks will be awaited with interest. Export business continues large and promising.

### Chicago.

(By Telegraph.)

Drought in the Northwest has not had the effect upon the Hardware trade experienced in the grain markets during the past week or two. The Hardware trade in the Northwest has in some localities suffered severely, even to the point of the cancellation of orders for goods bought for fall delivery by country dealers in the sun

parched districts, but elsewhere in the Dakotas and in Minnesota buying continues wholly satisfactory, while from other territory there is no question about the generous volume of business. From the Southwest especially large crops are being gathered, and the Hardware trade flourishes most bounteously. It has been a good week, possibly due in part to the warmer weather, which has brought quite a number of hitherto neglected articles to the front. Even in strike ridden Chicago orders are reported to be showing noticeable improvement. Trade may not be so good as in May, which was a phenomenal month in point of activity, but for June it is quite up to reasonable expectations. Some backwardness of buying has probably been occasioned by hope that for the approaching half year manufacturers will favor the trade with a semi-annual reduction in prices. Salesmen from the East, however, are circulating reports to their trade that their houses will not make notable departures this summer from lists and discounts now in force. Heavy Hardware maintains the steady pace, and representing, as it does, a manufacturing market quite largely, indicates a healthy state of Western industry. Orders from blacksmiths, wagon factories and all kinds of consumers are alike excellent.

### St. Louis.

As June draws to a close there is continued satisfaction expressed at the volume of business compared with that of last year. Traveling salesmen are always quick to send in reports as to unusual competition when such arises, but it is claimed that there is nothing of the kind at the present time worthy of mention. It is most interesting to mention that salesmen are almost unanimous in reporting an excellent outlook for fall trade. Agricultural districts are in a prosperous condition, especially throughout Indian and Oklahoma Territories and Kansas. Mention was made last week of the same bright prospects in Iowa and Nebraska. St. Louis carries on an extensive trade in the Northwestern States, and from reports received here it is expected that better results will be had than were made in crop estimates the past few weeks. The strength of the market has agreeably surprised jobbers. Demand is still reported for Screen Doors, Window Screens and Wire Cloth. Air Tight Heaters, Stove Boards, Coal Hods and small accessories have been specified quite liberally for fall trade. Pipe, however, has not been covered so generally. Window Glass is still spoken of as liable to be in short supply. Tin Plate may likewise prove scarce during shut down of mills. The general assortment of summer goods is in action, and especially in small towns conditions are favorable to disposition of goods. Considerable activity develops in the Heavy Hardware trade, and while buyers are not specifying more than immediate wants dictate, a better feeling is noted on all hands.

## Notes on Prices.

**Wire Nails.**—The situation in the Wire Nail market continues much the same as reported last week. Demand is restricted almost entirely to less than carload lots, and business is light. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days or 2 per cent. off in 10 days:

|                                             |        |
|---------------------------------------------|--------|
| To jobbers in carload lots.....             | \$2.20 |
| To jobbers in less than carload lots.....   | 2.25   |
| To retailers in carload lots.....           | 2.30   |
| To retailers in less than carload lots..... | 2.40   |

**New York.**—The local demand for Wire Nails is largely confined to small lots from store, owing to the policy pursued by dealers of ordering from hand to mouth. It

is reported that desirable orders of this kind have been accepted at less than the following prices:

|                                               |                |
|-----------------------------------------------|----------------|
| To retailers, carloads on dock.....           | \$2.48         |
| To retailers, less than carloads on dock..... | 2.61           |
| Small lots from store.....                    | \$2.60 to 2.65 |

*Chicago, by Telegraph.*—Only a moderate activity exists in the Nail trade. Farmers are busy with crops, and in cities labor disturbances continue to check consumption. But for the season little complaint is heard about the volume of business. From mill prices are unchanged, but store prices are slightly lower. From store quotations are \$2.43 for carload lots and \$2.50 for small lots.

*St. Louis.*—There is a fair Wire Nail business passing hands. No large purchases are known to have been made. The aggregate sales indicate the usual activity at this season. Single cars are \$2.53, base; smaller lots, \$2.63, base, St. Louis.

*Pittsburgh.*—Like everything else in the Iron trade just now, demand for Wire Nails is dull and is altogether for small lots. There is some unevenness in prices of Wire Nails among jobbers, who are making concessions in order to effect sales. Manufacturers' prices, however, are being firmly held. We quote Wire Nails as follows: To jobbers in carload lots, \$2.20; to jobbers in less than carload lots, \$2.25; to retailers in carload lots, \$2.30; to retailers in less than carload lots, \$2.40. Contracts at above prices can be made for shipment in 60 days from date of contract, the terms being 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

*Cut Nails.*—The condition of the Cut Nail market remains unchanged in the absence of any announcement of revised prices or terms by the manufacturers. They are to hold a meeting on Thursday of this week. No intimation has been given of what action may be taken at that time. Quotations are as follows, f.o.b. Pittsburgh, terms 30 days, 1 per cent. off in 10 days:

|                                             |        |
|---------------------------------------------|--------|
| Carload lots.....                           | \$2.05 |
| To jobbers in less than carload lots.....   | 2.10   |
| To retailers in less than carload lots..... | 2.20   |

*New York.*—The movement of Cut Nails in the local market is not large. Dealer's stocks are low, but they are ordering in quantities sufficient for present requirements only. Prices are as follows:

|                                                     |                |
|-----------------------------------------------------|----------------|
| To jobbers in carload lots on dock.....             | \$2.23         |
| To jobbers in less than carload lots on dock.....   | 2.28           |
| To retailers in less than carload lots on dock..... | 2.41           |
| Small lots from store.....                          | \$2.40 to 2.50 |

*Chicago, by Telegraph.*—Demand for Cut Nails is in keeping with the season, and some little effort is made to stimulate trade, but without notable success. Prices have settled down to about \$2.25 for small lots from store.

*St. Louis.*—Moderate sales and mostly for the smaller sizes of Nails. Prices are said to be unattractive to mills, and jobbers claim their selling price is still \$2.50, base, St. Louis.

*Pittsburgh.*—The Cut Nail market is very dull, buyers placing orders only for small lots. Established prices are as follows: Carload lots, \$2.05; less than carload lots to jobbers, \$2.10, all f.o.b. cars Pittsburgh, terms 60 days, or 2 per cent. off for cash if paid in ten days from date of invoice. It is stated that concessions are being made on these prices.

*Barb Wire.*—The Barb Wire market is dull, with a limited demand. Manufacturers' prices are firmly maintained. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in ten days:

|                                                         |        |
|---------------------------------------------------------|--------|
| To jobbers in carload lots, Painted.....                | \$2.50 |
| To jobbers in carload lots, Galvanized.....             | 2.80   |
| To jobbers in less than carload lots, Painted.....      | 2.55   |
| To jobbers in less than carload lots, Galvanized.....   | 2.85   |
| To retailers in carload lots, Painted.....              | 2.60   |
| To retailers in carload lots, Galvanized.....           | 2.90   |
| To retailers in less than carload lots, Painted.....    | 2.70   |
| To retailers in less than carload lots, Galvanized..... | 3.00   |

Ellwood and Baker Wire is 5 cents and Washburn &

Moen Gudden 10 cents per 100 higher than the foregoing prices.

*Chicago, by Telegraph.*—The surprising activity in Barb Wire has not wholly spent its force. Business does not total the amount of last week, but for the season it is unusually large. The demand is wide spread, and orders are usually for moderate quantities and for quick shipments. Quotations, Chicago delivery, are: Single cars of Plain Annealed, \$2.43; Painted Barb Wire, \$2.78; Galvanized Barb Wire, \$3.13, with 10 cents additional for small lots from jobbers.

*St. Louis.*—A slightly better movement is reported in Barb Wire, but really not enough to cause comment. Price in carloads: Painted is 2.83; Galvanized, \$3.13; smaller lots command 10 cents advance through jobbers.

*Pittsburgh.*—Demand for Barb Wire is very light, and very little trade is moving. We quote Galvanized Barb Wire at \$2.80 in carload lots to jobbers and Painted \$2.50. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

*Plain Wire.*—The movement in Plain Wire is moderate, but the tone of the market is strong. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

|                                             | Base sizes. |        |
|---------------------------------------------|-------------|--------|
|                                             | Plain.      | Galv.  |
| To jobbers in carload lots.....             | \$2.15      | \$2.55 |
| To jobbers in less than carload lots.....   | 2.20        | 2.60   |
| To retailers in carload lots.....           | 2.25        | 2.65   |
| To retailers in less than carload lots..... | 2.35        | 2.75   |

The above prices are for the base numbers, 6 to 9. The other numbers of Plain Wire and Galvanized Wire take the advances indicated in the following table:

| Plain Fence Wire Advances (Catch Weights). |                          |               |
|--------------------------------------------|--------------------------|---------------|
| Nos.                                       | Base.                    | Galvanized.   |
| 6 to 9.....                                | \$0.05 advance over base | \$0.40 extra. |
| 10.....                                    | .10                      | .40           |
| 11.....                                    | .15                      | .40           |
| 12 and 12½.....                            | .25                      | .40           |
| 13.....                                    | .35                      | .40           |
| 14.....                                    | .45                      | .40           |
| 15.....                                    | .55                      | .75           |
| 16.....                                    | .70                      | .75           |
| 17.....                                    | .85                      | 1.00          |
| 18.....                                    |                          | 1.00          |

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

*Pittsburgh.*—There is very little doing in Plain Wire, and jobbers in some cases are shading established prices. We quote:

|                                             | Plain. |
|---------------------------------------------|--------|
| To jobbers in carload lots.....             | \$2.15 |
| To jobbers in less than carload lots.....   | 2.20   |
| To retailers in carload lots.....           | 2.25   |
| To retailers in less than carload lots..... | 2.35   |

Galvanized Wire up to No. 14 is 40 cents advance on Plain, Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

*Rivets.*—Besides making a reduction in the base discount on Rivets the manufacturers at their meeting last week returned to the former terms, making 2 per cent. discount for cash in ten days. A reduction in the price of Rivets was made by the adoption of the discount of 62½ per cent., instead of 57½ per cent., the former base.

*Carriage Bolts, Machine Bolts, &c.*—In sympathy with the course of the Iron market and influenced doubtless by the irregular prices at which Carriage Bolts and related goods have been selling, a further reduction was made last week by the manufacturers in the prices of this line. There continues to be a good deal of irregularity in the market on these goods, and the jobbers are often making lower prices than those given below. The regularly announced association prices are as follows:

|                                                   | Discount.       |
|---------------------------------------------------|-----------------|
| Common Carriage Bolts.....                        | 60, 10 and 10 % |
| Machine Bolts with H. P. or C. P. Plain Nuts..... | 70 and 10 %     |
| Machine Bolts with C. & T. Nuts.....              | 70 %            |
| Machine Bolts without Nuts.....                   | 70, 10 and 10 % |
| Machine Bolts, blanks.....                        | 70 and 10 %     |
| Bolt Ends with H. P. or C. P. Plain Nuts.....     | 70 and 10 %     |
| Bolt Ends with C. & T. Nuts.....                  | 70 %            |



**Tire and Stove Bolts.**—At a meeting of the manufacturers of Tire and Stove Bolts, held in New York on Tuesday, no change was made in prices, existing quotations being confirmed. This was deemed a wise course to pursue in view of the relatively moderate advances which were made in these lines. There continues to be, however, a good deal of cutting by the jobbers on Tire Bolts.

**Hot Pressed Nuts.**—At a meeting of the manufacturers held last week a reduction was made in the prices of Hot Pressed Nuts. Present quotations are as follows:

|                                      | Off List. |
|--------------------------------------|-----------|
| Hot Pressed Blank Square Nuts.....   | 5.20      |
| Hot Pressed Blank Hexagon Nuts.....  | 5.50      |
| Hot Pressed Tapped Square Nuts.....  | 5.00      |
| Hot Pressed Tapped Hexagon Nuts..... | 5.30      |

**Zinc.**—Under date June 18 a reduction was made in the price of Sheet Zinc, which is now quoted at a base price of 6½ cents per pound in 600-lb. casks. This price is subject to a cash discount of 3 per cent. and the usual quantity discounts, which together with the cash discount make the discounts on the different quantities as follows:

|                            | Discount. |
|----------------------------|-----------|
| Carload lots .....         | 8 %       |
| 9000 pounds .....          | 6 %       |
| 6000 pounds .....          | 5 %       |
| 3000 pounds .....          | 4 %       |
| Less than 3000 pounds..... | 3 %       |

**Cold Punched Nuts.**—As a result of the decline which has taken place in the price of Iron the manufacturers of Cold Punched Nuts have also made a reduction in their prices. Present quotations regularly announced by the manufacturers are as follows:

|                                             | Off List. |
|---------------------------------------------|-----------|
| Cold Punched Plain Blank Square Nuts.....   | 4.30      |
| Cold Punched Plain Blank Hexagon Nuts.....  | 4.40      |
| C. T. & R. Blank Square Nuts.....           | 4.10      |
| C. T. & R. Blank Hexagon Nuts.....          | 4.70      |
| Cold Punched Plain Tapped Square Nuts.....  | 4.10      |
| Cold Punched Plain Tapped Hexagon Nuts..... | 4.20      |
| C. T. & R. Tapped Square Nuts.....          | 3.90      |
| C. T. & R. Tapped Hexagon Nuts.....         | 4.50      |

There continues to be some unevenness in the market for this line, and the demand is only fair, as there is an indisposition to purchase beyond early requirements.

**Bright and Annealed Market Wire, &c.**—The prices on Bright and Annealed Market Wire, Coppered and Galvanized Wires, Tinned Wires, &c., are not entirely even, and lower prices are being gradually developed. The condition of the market is in a general way represented by the following prices on round lots, somewhat better prices being obtainable on desirable orders:

**Bright and Annealed Market.**

|                    | Discount.          |
|--------------------|--------------------|
| Nos. 6 to 9.....   | 75 %               |
| Nos. 10 to 18..... | 75 and 5 %         |
| Nos. 19 to 26..... | 75 and 15 %        |
| Nos. 27 to 36..... | 75 and 10 and 2½ % |

**Coppered and Galvanized.**

|                    | Discount.          |
|--------------------|--------------------|
| Nos. 6 to 9.....   | 70 %               |
| Nos. 10 to 18..... | 70 and 5 %         |
| Nos. 19 to 26..... | 70 and 10 %        |
| Nos. 27 to 36..... | 70 and 10 and 10 % |

**Tinned Market and Stone.**

|                    | Discount.          |
|--------------------|--------------------|
| Nos. 6 to 14.....  | 70 and 10 and 10 % |
| Nos. 15 to 18..... | 70 and 10 and 5 %  |
| Nos. 19 to 26..... | 70 and 10 %        |
| Nos. 27 to 36..... | 70 and 5 %         |

**Coach Screws, Lag Screws, &c.**—The following reduced prices on Coach Screws, Lag Screws, &c., were adopted on the 20th inst. by the manufacturers:

|                                      | Discount.          |
|--------------------------------------|--------------------|
| G. P. Coach Screws.....              | 70, 10 and 10 %    |
| Cone Point Lag Screws.....           | 70, 10, 10 and 5 % |
| Skein Screws.....                    | 70, 10 and 10 %    |
| Forged Set Screws and Tap Bolts..... | 40 and 10 %        |
| Plow Bolts and Guard Bolts.....      | 50 and 10 %        |

**Scythes.**—The volume of business done by the associated manufacturers during the past season was not up

to their capacity. This is owing in part to the fact that a good many Scythes were carried over from last year, but the prices established by the combination have also had an important influence in repressing business. The trade regard existing prices as unreasonable and are getting along with as few goods as possible.

**Springs.**—Another reduction of ¼ cent per pound has been made by the manufacturers of Springs, whose present prices on factory shipment are represented by the following quotations, terms 60 days, or 2 per cent. discount for cash in 10 days:

|                                                                      | Per 100 lbs. |
|----------------------------------------------------------------------|--------------|
| Ground Black.....                                                    | \$4.25       |
| Ground Half Bright.....                                              | 4.25 to 4.50 |
| Ground Bright.....                                                   | 4.75         |
| Rubber Head Springs, Bright, Rubber and Brass Bushed, per pound..... | 4¾ cents.    |

**Painted Seat Springs.**

|                               | Per pair. Cents. |
|-------------------------------|------------------|
| 1½ x 2 x 26 and smaller.....  | 45               |
| 1½ x 2 x 28.....              | 52½              |
| 1½ x 3 x 28 and narrower..... | 67½              |

**Lead Pipe, Sheet Lead, &c.**—An advance of ¼ cent per pound in Lead Pipe and Sheet Lead is announced by the manufacturers under date June 25. Present prices are as follows, subject to the usual discount of 20 per cent.:

|                                     | Cents. |
|-------------------------------------|--------|
| Lead Pipe, per pound.....           | 6      |
| Sheet Lead, per pound.....          | 7      |
| Tin Lined Lead Pipe, per pound..... | 12½    |

**Mrs. Potts' Sad Irons.**—A reduction in price has recently been made in Mrs. Potts' Sad Irons, the present quotations of the associated manufacturers being as follows:

|                            | Per Set. Cents. |
|----------------------------|-----------------|
| No. 50, 10-dozen lots..... | 70              |
| No. 50, smaller lots.....  | 75              |
| No. 55, 10-dozen lots..... | 65              |
| No. 55, smaller lots.....  | 70              |

On 10-dozen lots and larger goods are delivered to jobbing points east of the Mississippi, but on smaller lots terms are f.o.b. factory.

**Bright Wire Goods.**—In sympathy with the decline in the price of Wire, manufacturers of Bright Wire Goods have decided to make a reduction in price, to go into effect on July 1. It is anticipated that it will be about 20 per cent.

**Wrought Iron Pipe.**—There continues to be only a moderate movement of Wrought Iron Pipe, and in view of changes which have taken place in the market and some diversity in the matter of lists and form of discounts, there is a good deal of unevenness in current quotations. Some of the jobbers are quoting net prices, as illustrated in those given below, which are the quotations of a well-known Western house:

**Net Prices per 100 Feet.**

| Nominal size.....    | ¼ to ¾  | ¾       | 1       | 1¼      | 1½      | 2       | 2       |
|----------------------|---------|---------|---------|---------|---------|---------|---------|
|                      | Com.    | P.&R.   | Com.    | P.&R.   | Com.    | P.&R.   | Com.    |
| Black Pipe.....      | \$1.85  | \$3.55  | \$4.00  | \$5.74  | \$7.83  | \$9.40  | \$12.53 |
| Galvanized Pipe..... | 3.67    | 4.83    | 5.73    | 8.22    | 11.20   | 13.45   | 17.90   |
|                      | 2¼      | 2½      | 3       | 3       | 3½      | 4       | 4½      |
|                      | Com.    | P.&R.   | Com.    | P.&R.   | Com.    | P.&R.   | Com.    |
| Black Pipe.....      | \$20.01 | \$21.16 | \$26.27 | \$27.78 | \$33.06 | \$37.48 | \$49.14 |
| Galvanized Pipe..... | 28.63   | 29.78   | 37.60   | 39.11   | 47.31   | 53.78   | 68.64   |

In view of the condition of trade and the course of the Iron market, it is thought not improbable that a substantial reduction will be made by the manufacturers before long.

**Horseshoes.**—The manufacturers of Horseshoes had a conference last week, but no change was made in current quotations. There continues to be more or less unevenness and uncertainty in the market. Most of the manufacturers are selling on the basis of \$3.75, which is subject to a general discount of 5 per cent. on Shoes on the A list, and of 10 per cent., or perhaps a shade better, on Shoes on the B list. There is not entire uniformity of prices in regard to freight allowances or deliveries.

**Paris Green.**—The drawing to a close of the Paris Green season has not stimulated business in this line. It is too early to anticipate what the demand from the South may be later in the season. The market continues dull at the former range of 12½ to 14 cents per pound in bulk, according to quantity and customer.

**Glass.**—The report is in circulation that the American Window Glass Company have proposed to set aside a block of their stock for the benefit of Glass workers, to increase their loyalty to the combined factories, and it is supposed to make it difficult for the independent factories to secure workmen. A paper devoted to Window Glass interests makes the following statement:

The American Window Glass Company have agreed to set aside 5000 shares of stock, to be placed in the hands of the Union Trust Company of Pittsburgh, to be held in trust for the workers' association for a period of three years. The workers are to pay 6 per cent. annually for carrying charges, while the dividend earning power of the stock is to be devoted to the payment of the principal, which is to become the property of the workers' union when thus paid up.

It is calculated that the stock will become, under this arrangement, the property of the association at the end of three years. Demand for Glass is only moderate. Prices are unchanged as follows to Eastern jobbers, in less than carload lots: Single strength—First bracket, 85 per cent.; second and third brackets, 85 and 10; all above, 85 and 25. Double strength—First bracket, 85; second, third, fourth and fifth brackets, 85 and 10; all above, 85 and 20. Factory prices for carloads are as follows:

|                                          |                  |
|------------------------------------------|------------------|
| Single strength:                         |                  |
| First bracket.....                       | 85 and 25%       |
| Second and third brackets.....           | 89%              |
| All above.....                           | 90 and 5%        |
| Double strength:                         |                  |
| First five brackets.....                 | 89%              |
| 60-inch bracket.....                     | 90%              |
| 70 and 100 inch brackets, inclusive..... | 90 and 10 and 5% |
| All above.....                           | 90 and 20%       |

**Paints and Colors.**—*Leads.*—On June 21 the prices of Lead products were reduced ½ cent per pound by manufacturers. White Lead, dry or in Oil, Red Lead and Litharge are affected by the change. While a reduction in the price of Lead products was considered probable by the trade, it was hardly expected before July 1. Manufacturers' quotations are as follows: In lots of 500 pounds or over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

**Oils.**—*Linseed Oil.*—The high price of Flax Seed and the uncertainty of the market in the future restricts competition on the part of crushers and reduces offerings of Linseed Oil. Business is very quiet and only pressing necessities, which are limited, calls out any inquiry for Oil. There is still 2 cents difference per gallon between city crushers for Raw Oil, prices ranging from 65 to 67 cents in lots of five barrels or more. Western and State Oil is quoted at 64 cents.

**Spirits Turpentine.**—Local stocks of Turpentine have increased during the past week. In absence of any but limited inquiries prices declined to 45 cents for Southern and 45½ cents for machine made barrels.

## Hardwaremen and Sewing Machines.

**T**HE Demorest Mfg. Company, Williamsport, Pa., advise us that they have increased their business in Sewing Machines within the present year threefold. A large proportion of this increase they attribute to the fact that they have catered more to the Hardware trade than ever before. This they did after carefully watching the returns, concluding from this observation that Hardware dealers as a rule are more responsible and prompt in their payments than the exclusive dealer in Sewing Machines, a large majority of them discounting their bills, thus making their trade very desirable and satisfactory. They also report a large increase in their export trade through their New York office, at 153 West Twenty-third street.

## Texas Retail Hardware and Implement Dealers' Association.

At the annual meeting of the Texas Retail Hardware and Implement Dealers' Association at Houston on the 19th inst. the following officers were elected for the ensuing year: W. H. Richardson, Austin, president; J. D. Hefley, Cameron, first vice-president; C. Dickson, Cleburne, second vice-president; James G. Blaine, Taylor, secretary-treasurer; J. L. Hollingsworth, Temple; G. L. Smith, Hillsboro; W. S. Allen, Calvert; H. F. Lowe, Weatherford; Edward Lewis, Gonzales; W. M. Grinnell, Marlin; D. M. Smith, Sulphur Springs, and T. T. Clark, Ennis, members of Executive Committee.

At a meeting of the Executive Committee held subsequent to the adjournment of the annual convention the following resolutions were submitted by a committee appointed for that purpose, and, after some discussion, were unanimously adopted:

### Resolutions Adopted.

#### FREIGHT QUESTION.

*Resolved 1,* That the freight question enters so largely into the cost of our business that we protest against the many unjust and arbitrary changes in rates and rulings, and demand the restoration of mixed cars for kindred goods of the same lines and the same rates, and that our freight commission be instructed to lay this matter before the traffic managers of the principal freight roads, the State and interstate railway commissions, and vigorously prosecute this resolution to this end.

#### DISCRIMINATION BETWEEN JOBBERS AND RETAILERS.

*Resolved 2,* That this association condemn the practice of manufacturers making a discrimination in prices between jobbers and retail dealers, quantities considered, we contending that a single carload buyer, if a legitimate dealer, should be able to buy his goods on the same basis as one who claims to be a jobber.

#### JOBBERS' DISCOUNTS.

*Resolved 3,* That we, by petition to the Governor of Texas and the Superintendent of the State Penitentiary, demand the abolishment of their so-called jobbers' discount, believing that the products of State institutions should be sold to the dealers of the State at equal prices and terms. As it is, we have to place our orders through St. Louis or other jobbers to secure the State product at fair prices.

#### INSURANCE.

*Resolved 4,* That a Committee on Insurance be created, and that it shall perfect a plan of mutual insurance or secure rates through the insurance companies now operating, and that prompt action be taken in this matter.

#### CATALOGUE HOUSES AND CONSUMERS

*Resolved 5,* That we protest against the practice of manufacturers who solicit the trade of the retail dealers of Texas, and who sell to catalogue houses and quote and ship direct to consumers, as such misleads and demoralizes prices, tends to break confidence and is injurious to legitimate dealers.

#### COMMITTEE TO CALL ON MANUFACTURERS AND JOBBERS.

*Resolved 6,* That a committee be selected at this meeting whose duty it shall be to call upon the manufacturers and jobbers and urge them to discontinue this practice and to confine themselves to the regular and legitimate methods of the trade. That we present to these people the solemn protest of the combined Hardware dealers of Texas through this association against this pernicious system and demand of them a definite answer as to whether or not we can depend upon a discontinuance, directly or indirectly.

#### IMMEDIATE ACTION ORDERED.

*Resolved further,* That, as the issue must come sooner or later, this committee take immediate steps to carry out the wishes of this association and report the result of their efforts to the president of this association.



## Indian Territory Hardware Association.

**I**N our last issue we chronicled the formal organization of a Hardware association in Arkansas at a largely attended meeting at Little Rock. This week we are pleased to announce that merchants of Indian Territory, the Western neighbor of Arkansas, are at work with a view to forming a similar association to look after the welfare of the Hardwareman in that part of the country. For this purpose a meeting has been called for July 12 in South McAlester, as per the following characteristic circular letter which has been sent to every Hardware merchant in the Territory:

We have been considering very seriously for some time the advisability of the organization of the retail Hardware dealers of the Indian Territory, embracing the five nations—namely, the Choctaw, Chickasaw, Seminole, Creek and Cherokee. We have wondered for some time why some one did not make a start in this direction, and then it appeared to us that possibly every other dealer, like ourselves, was perhaps wondering why some one did not wake up to the situation and make a start.

It is a fact, and no up to date Hardware dealer in the Indian Territory can dispute it, that in all States and Territories where the Hardware dealers have organized these associations they are reaping great benefits, and we dare say that if some of the Hardware dealers in the Indian Territory that have failed to keep up with the situation were in possession of one-half of the ways and means by which dealers are benefited who belong to these associations they would be doing all in their power to help the good work along—namely: *The organization of a retail Hardware dealers' association in the Indian Territory.*

Giving up all hopes that some Hardware dealer would make the start, we concluded to make an effort. So about the middle of May we addressed a letter to every Hardware dealer in the five nations that we could obtain the address of, and we are glad to say that we at once began to receive good news, telling us that they were glad to see some one moving off in the right direction, and that they were heartily in favor of the move and ready to put their shoulders to the wheel and help in any way they could to get the Hardware dealers of the Indian Territory out of the mire, as it were, and place them in the band wagon.

There were some few dealers who failed to answer our letter, but certainly we can't think that it was because they did not believe this a good move, in the right direction, and we console ourselves in this way: That they were perhaps very busy when our letter reached them, and it was very carefully deposited in their portfolio, expecting to answer it when they had a little idle time, hence they forgot it.

Now won't you kindly acknowledge the receipt of this circular letter and tell us that you will be sure to meet with us at South McAlester on the morning of July 12, at 10 o'clock sharp? Every up to date Hardware dealer in the Indian Territory will be there and that includes you. If you did not get our letter in May it was because we did not have your address, and not that we intended to slight you. So wake up, shake your old clothes, get you a palmetto fan, and start for South McAlester in time to get there at the above date.

Very respectfully,

HALE & MALONE,  
Durant, Ind. Ter.

## Domestic Prices to Hawaiian Islands.

**T**HE following communication calling attention to the changed commercial relations between the Hawaiian Islands and the United States, which became effective June 14, 1900, is from a large and well-known Pacific Coast concern, who are importers, manufacturers and wholesale dealers in Hardware, Agricultural Implements and kindred lines:

On June 14, 1900, the Hawaiian Islands became a full fledged Territory of the United States, and the citizens of those islands are now enjoying all the benefits, likewise the burdens, of citizenship.

In times past the islands have been considered export trade, and many American manufacturers have been giving the islands much lower prices than they have for domestic consumption.

Inasmuch as the admission of the islands into the Union relieves buyers, sellers and shippers from any custom house formalities, you will readily understand how easy it would be for interested parties to make purchases at export prices, representing they were going to the Hawaiian Islands, and then divert the goods to some American port, making a handsome saving between export and domestic prices.

I take this matter up with you in the interest of American manufacturers, and ask you to kindly write an article on the subject calling attention of the American manufacturers to the fact that the Hawaiian Islands now should not be considered as an export country and should be charged domestic prices, the same as any other State or Territory of the Union.

The discrimination formerly existing should be stopped in the interests of the jobbers who have in times past frequently had to meet the competition of goods that were sold for export (?), but which unfortunately were returned to the United States to enter into active competition with goods bought at the domestic price.

## Request for Catalogues, &c.

**L.** E. MILLER, formerly of the firm of Miller & Nagel, has succeeded Wm. Boyd & Son, Anaheim, Cal. The store has been rearranged with a view to increasing stock of Shelf Hardware, Steel Goods, Paints, &c. Mr. Miller also handles Stoves, Sporting Goods, Crockery, Glass Ware, Plumbing Goods, &c., and requests copies of catalogues and price-lists from the trade.

## Trade Items.

**A**T a meeting of the Steel Goods Association, held at the Waldorf-Astoria Hotel, New York City, on Wednesday, June 20, the members of that association, as well as the members of the National Snath Company, availed themselves of the opportunity to present to the president of the Steel Goods Association, General W. H. Withington of the Withington & Cooley Mfg. Company, a token of their high regard and esteem in the form of an elegant sterling silver punch bowl and ladle. Mr. Withington was taken entirely by surprise, as the presentation remarks of Mr. Kretsinger, the president of the Iowa Farming Tool Company, led him to infer that an unfavorable criticism, rather than a kindly one, was to be passed upon his official acts as president of the association. The General replied in a feeling manner, and the occasion was one enjoyed by all present.

THE ST. JOSEPH PUMP & MFG. COMPANY, St. Joseph, Mo., have purchased of the Quincy Hardware & Mfg. Company all machinery and small tools used by the latter in the manufacture of Galvanized Iron Chain Pump Tubing, Galvanized Iron Curbs, Guttering, Down Spouting and Eave Troughs. The St. Joseph Pump & Mfg. Company have this equipment in place, and by July 1 they expect to place before the trade a complete line of all sizes of Galvanized Chain Pump Tubing, Curbs, &c. They say that they will manufacture these articles exclusively for the jobbing trade, thereby continuing the policy which they have carried out for the past 15 years on the Perfection Water Elevator and Purifying Pump in selling to jobbers only.

ANNOUNCEMENT is made that on and after June 25 the general business offices of the Lappin Brake Shoe Company will be located at their Eastern works, Bloomfield, Essex County, N. J., to which all letters and remittances should be addressed.

The Cooper Mercantile Company have been organized, at Cooper, Texas, with a capital stock of \$20,000, and these officers: W. H. Jones, president; J. L. Ratliff, vice-president, and J. R. Albright, secretary and treasurer. They are dealers in Hardware, groceries, dry goods, &c.

Late orders received by the J. D. Warren Mfg. Company of Chicago for Warren Cabinet Shelving were from C. B. Scott, Scranton, Pa.; Johnson, Peterson & Co., Hector, Minn.; Agard Hardware Company, Torrington, Conn., and J. H. Schmidt, Elkport, Iowa, the latter placing his second order for an extension to his present outfit, purchased last year.



A SAW is one of the most ancient of tools. It was in use in prehistoric times, for the discovery was very early made that in many cases wood and other materials could be cut more easily by a toothed blade than by one with a smooth edge.

Never has there been an age when the Saw ceased to be employed. Its utility has been gradually increased, and its varieties multiplied, the Circular Saw and the Band Saw being comparatively recent developments. Many other forms of toothed tools are also used for cutting purposes.

A Saw to-day is made with the same care and precision as the highest grades of modern tools, and the finished product is very different from the ancient Saw with its crude and irregularly notched blade.

Little does one accustomed to use or handle a Hand Saw think of the amount of labor which must be ex-

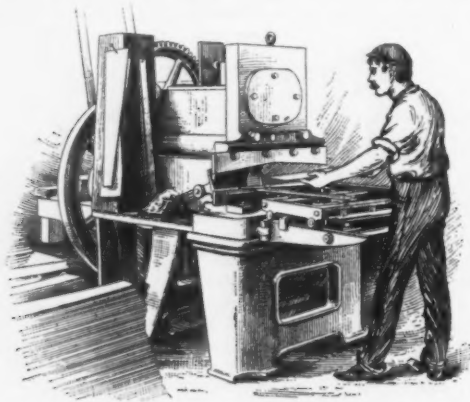


Fig. 1.—Cutting Out the Blanks.

pendent in manufacturing one of these common tools. Neither does he appreciate the many operations which must be gone through before the rough, black sheet of steel becomes the finished and polished Saw, which may be bent double and springs back in place without leaving a trace of the strain which has been sustained.

A representative of *The Iron Age* with his camera was privileged to spend a day in the extensive works of Henry Disston & Sons, Philadelphia, Pa., watching the making of the higher grade of Hand Saws. A brief description of the process may be of interest.

The sheets of crucible steel, rolled to gauge in the company's own mill, are taken into the factory on a small push car, and are piled beside a shearing machine, illustrated in Fig. 1, into which they are fed by hand against stops, so that the sheet will be in the desired position for the knife to cut it into the proper shape. When it is in position the operator trips the machine, making the knife descend, cutting out the blank. The knife then returns to its original position, and remains there until tripped again by the operator.

The character of the cut, whether straight or curved, for a Straight Back or a Hollow Back Saw, depends on the shapes of the knives used.

From the illustration it will be seen that the edge of

the knife is of such shape that the ends strike the sheet first, and that only a very small part of the blade is cutting at a time. This makes the machine take less power and subjects it to less strain than if the edge of the blade were straight.

The sheets from which the Saw blanks are cut are of such size that two blades can be cut out from each sheet.

The blanks are now presumably of the same size and thickness. To determine if any steel of wrong

gauge has been used, or if the blank is of wrong size, each blank is weighed, this being the most simple method of determining if it is of proper size and thickness.

The next operation, that of cutting the teeth, is shown in Fig. 2. The blank is fed to the machine from left to right by hand, between two pairs of small rollers re-

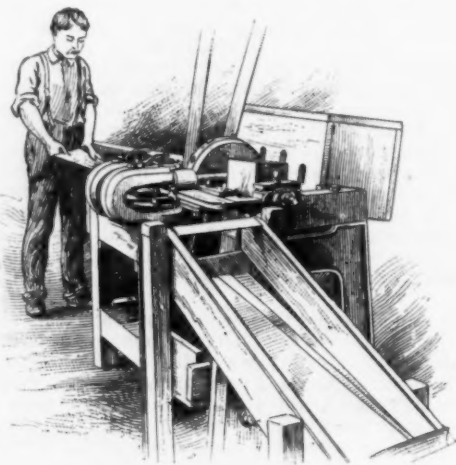


Fig. 2.—Cutting the Teeth.

volving at an even speed, carrying the blank over a die and in the path of a rotary cutting tool, revolving at a speed much higher, but in proportion to that of the rollers. This, striking the blank, nicks out little triangles of steel and leaves the teeth in their crude form.

The speed of the cutter in relation to the speed of the rollers governs the number of teeth cut to the inch. Thus, the cutter must revolve twice as rapidly to cut out 12 teeth to the inch as to cut out six, the rollers feeding the blank revolving at the same speed in both cases. As

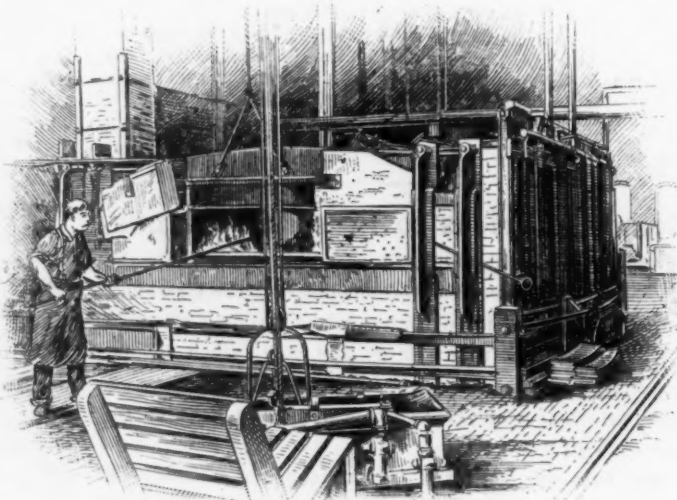


Fig. 3.—The Hardening Furnace.

slight burrs frequently project from the Saw after this operation, the blank is passed between a pair of steel rollers. This completely removes the burrs, and leaves



the edges of the teeth smooth. Any burrs, however, on the points of the teeth are removed afterward in the sharpening.

To the untrained eye the Saw blade now looks as if it were made of ordinary sheet iron. The next step is an important one, and is one of the series which helps to give character and value to the tool. The Saw blades at this stage are too soft for use and must be hardened. To do this they are put in a hardening furnace, shown in Fig. 3. This is a brick furnace, the large tile floor of which is heated to a brilliant red by coal oil. The Saw blades are placed in this furnace and are heated to a bright red. They are then taken out with tongs and plunged edge first into an oil bath, making both sides of the same hardness. This makes them very hard, "glass hard," as it is termed, so that they become as brittle as glass, and must therefore be handled carefully.

In order to make the Saw blades so that they can be

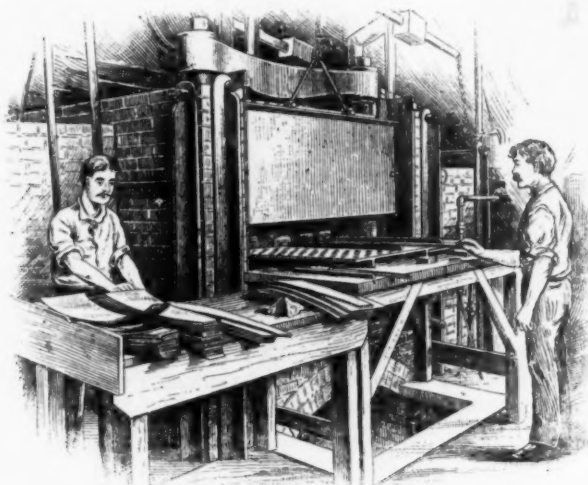


Fig. 4.—Tempering.

used they must now be tempered, or a certain amount of this extreme hardness removed, this being done by bringing them in contact with less heat than they underwent in the hardening furnace. They are accordingly placed in a tempering or annealing furnace, illustrated in Fig. 4. In this they are put upon a circular iron die, which revolves, and is heated with coal oil. This die is raised by hydraulic pressure and the Saws are squeezed between it and the top die of the press to straighten out the blades and remove any warping that may have taken place during the operation of hardening. The blades remain in this press for some seconds and then, being properly tempered, are removed.



Fig. 5.—Smithing.

The next step is that of "smithing," as shown in Fig. 5. Here the Saws are hammered and flattened and made perfectly straight, all curves and bends being taken out by the skillful hammering of the mechanics. This is work which requires great skill and experience. The Saw is next ground to gauge and to a taper so that the back will be thinner than the cutting edge. This operation is shown in Fig. 6. In it the Saw blades are fed between a large grindstone and a pressure plate and are then returned automatically to the hands of the feeder, who puts them through the grinder again and again until the blades are ground to the thickness and form desired. The back of the blade is ground to taper from the teeth to the back and from the handle to the

point. The tooth side and hilt are of an even edge. One Saw, being picked up just as the grinder had finished with it, gave the gauge readings as shown in Fig. 7, which graphically illustrates the correct taper of a well ground Saw. The cutting edge was perfectly even, showing a reading of 19 at any point. The end of the Saw

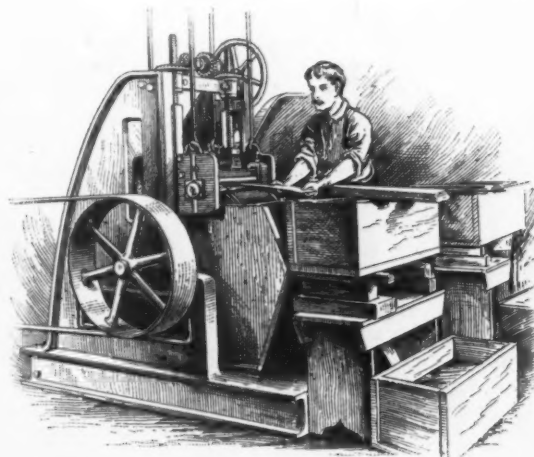


Fig. 6.—Grinding to Taper.

blade where the handle is attached also measured 19. The back tapered gradually from 19 at the handle end to 22 at the other end. The end of the saw blade away from the handle tapered from the teeth to the back, giving readings of from 19 at the teeth to 22 at the back. A Saw not ground to proper taper cannot be ranked as a high class tool.

The grinder becomes very expert in the work, and by carefully feeling the weight of the blade in his hands, can tell quite accurately when it is properly ground. When he thinks it is nearly finished he measures it with a gauge, and when found to be correct it is passed on to the next operation, that of "drawing," as shown in Fig. 8.

Here the Saw is ground on a finer stone and the surface prepared to take the high polish to be given by the "glazing machine," Fig. 9. In this operation the Saw is placed on a board, dusted with emery powder and run between wheels faced with horsehide, being carried

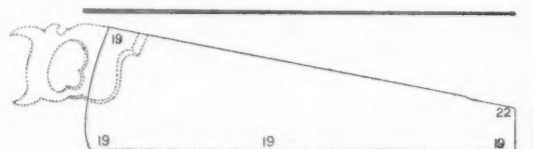


Fig. 7.—The Correct Taper of a Saw.

along by two revolving rollers. A beautiful polish is thus imparted to both surfaces of the blade.

The next step, that of "blocking," illustrated in Fig. 10, is an important one. Each blocker is provided with an anvil and a lignum-vitæ block, on which he hammers the Saws so that they shall not be too fast or loose, but shall possess the proper tension, spring or character. If the Saws are what is termed "fast" the metal is too long on the edge and needs hammering through the center, or if too "loose," the metal must be stretched on the edge. All Saws of whatsoever kind are made loose through or toward the center, so as to keep the edges stretched tight, which enables them to cut in a straight line, as otherwise they would run zigzag through the kerf.

Fig. 11 illustrates the process of rubbing, or burnishing. In this all marks made by the hammers of the blockers are removed, and a high finish is given to the Saw.

The next step is that of setting the teeth, shown in Fig. 12. Here each tooth is set by a stroke of a hammer.

The experienced workmen perform this work with wonderful accuracy and rapidity.

Setting the teeth of a Saw consists of bending them so that one tooth is inclined to the right, the next to the left, and so on throughout the entire length of the blade; they thus slightly protrude beyond the side of the Saw, which is necessary that they may make sufficient clear-

stiffened by being put into a bath of heated oil. After remaining in this for a short time they are removed, the oil allowed to drip off, then they are rubbed in a box of sawdust, which thoroughly removes all adhering oil.

The Saw blade now passes on to the etching room, a corner of which is shown in Fig. 15, where the name, brand, trade mark, &c., are etched on the Saw with acid.

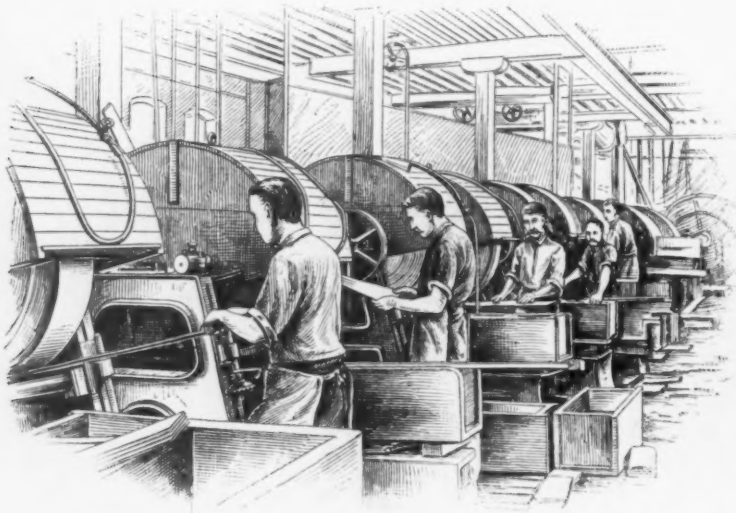


Fig. 8.—Drawing

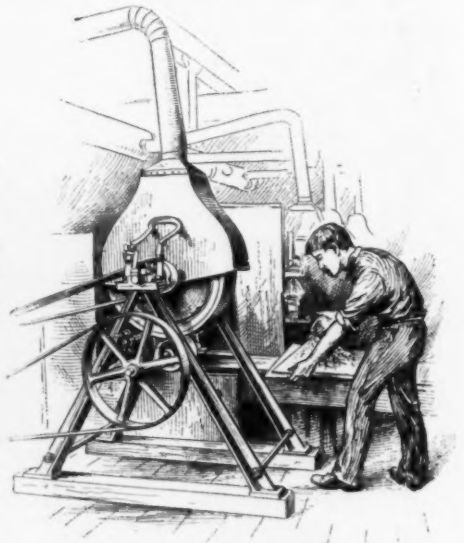


Fig. 9.—Glazing.

ance for the body of the blade, so that it will not stick in the cut or kerf, though this is somewhat overcome by the special grinding, which leaves the blade tapering from the toothed edge to the thin back.

Following this is the filing, illustrated in Fig. 13. In this the Saw is held in a vise, and each tooth carefully filed by hand. Henry Disston & Sons make all the files used in the works.

It may be noticed that here the teeth are first set and then filed. This is contrary to the practice of some car-

Impressions of whatever it is intended to etch on the Saw blade are taken with transfer ink on a porous paper from steel plates containing the design. Two presses



Fig. 10.—Blocking.

penters, who file the teeth first and then set them. The object of setting the teeth first is to avoid the possibility of injuring them after they have been sharpened.

Fig. 14 illustrates an extremely important operation, that of stiffening. The different processes and the hammering which the Saw blade has passed through has altered the arrangement of the molecules in the metal. In order that they may assume an arrangement which shall give the blade the desired qualities and spring, they are



Fig. 11.—Burnishing.

for this purpose are shown in the illustration. These pieces of paper are then put on the blades, and, after a slight rubbing, the paper is moistened and taken off, leaving the ink impression on the surface of the blade; the surrounding space is then varnished so as to protect it from the acid. When this is dry the acid is applied, eating in except where the steel is protected by the transfer ink and varnish, thus producing the desired marking. The Saw blade is then cleaned and is ready for the next operation, that of handling.

A brief description of the process of making a handle may be in order. The thoroughly seasoned and selected lumber is stored in large piles in the yard, which com-



Fig. 12.—Setting the Teeth.



parens in size well with many large commercial lumber yards. It then receives the complete and final drying in the drying room, whence it passes to the planing machines, where it is planed down to an even thickness. It is next sawed into small pieces, generally of such size that two handles may be made from each of them. The markers then make the shape of the handles with lead pencils around sheet steel patterns. They are then cut out by the band saws, after which a hole is bored in the center, through which the jig saw enters and cuts out the center piece.



Fig. 13.—Filing.

"Jimping" is the next operation. In this the roughly cut out handles are brought in contact with swiftly revolving cutters, and the edges are rounded. The handles now pass on to the filers, who work them into the finished shape. This is followed by sandpapering on a belt machine. The next step is varnishing and polishing, after which comes "slitting," as it is called in the factory, or the process of sawing the slot in the handle in which the

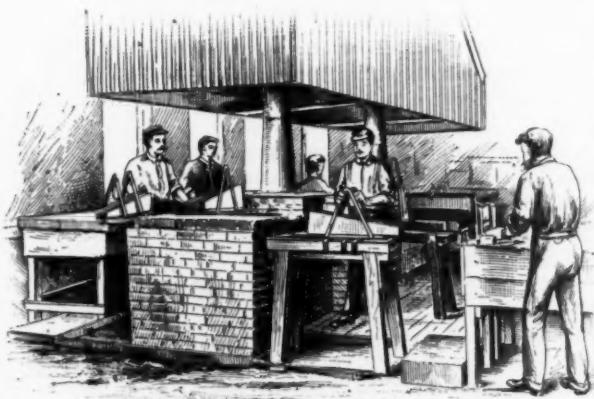


Fig. 14—Stiffening.

Saw blade rests. In connection with this operation the handles are bored and countersunk for the bolts.

One of the rooms in the handle factory is shown in Fig. 16.

The woods used chiefly for making handles are beech, apple, cherry, walnut and hard woods from South America. Beech is the wood generally used, but apple is the favorite with many.

The completed handle is placed on the Saw in the proper position and a man with a punch marks the steel blade, through the holes already bored in the handle. This is illustrated in Fig. 17. The Saw is then passed to a boy on the other side of the bench, who removes the handle, and, where the marks of the punch are, punches holes in the Saw blade with a foot press. He then replaces the handle and passes it to the next table, where it is bolted on.

The Saw is now completed and needs but a final rubbing up and packing to be ready for the stock room.

The making of the bolts which fasten the handle and Saw together is worthy of attention. Formerly they were cast of brass, but now the foundry is idle because new machinery permits the bolts to be made much more cheaply and satisfactorily by an entirely different method.

The bolt is made of two pieces. The first, Fig. 18, is a fluted washer stamped out of sheet brass. The second, Fig. 19, is automatically made by feeding brass wire from a coil into a machine, which forms a rivet head on it, and then cuts off the shank at the right length, as

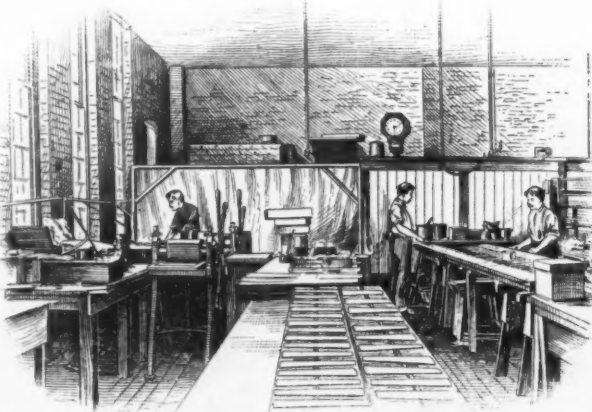


Fig. 15.—A Corner of the Etching Room.

shown in the illustration. The rivet is next placed within the washer, Fig. 20, in a press, and when the die containing the Disston trade-mark is brought against the rivet and washer with the requisite pressure they are formed into one piece showing the clear cut trade-mark on top, Fig. 21. The edge of the top is now trimmed so as to be perfectly smooth. After this the thread is cut and the bolt is complete, as illustrated in Fig. 22.

The nut, which must now be made, is pressed into shape as shown in Fig. 23, then bored and tapped; after being slotted the operation is completed. The finished nut is illustrated in Fig. 24.

The cardboard boxes in which the Saws are packed are made in Disstons' paper box factory, which occupies a part of one of their large buildings, and for which a new building is now in process of erection. A view of one of the rooms is shown in Fig. 25.

The making of a high grade Hand Saw from start to finish calls for the most careful workmanship and constant attention. At each stage of the work it is inspected, and the system for accomplishing this is so thorough that it is almost impossible for an inferior article to pass out of the works as a high grade and perfect tool.

The lower grades of Saws receive, of course, less care in the manufacture, according to their quality and price, but are never branded with the name Disston, which is

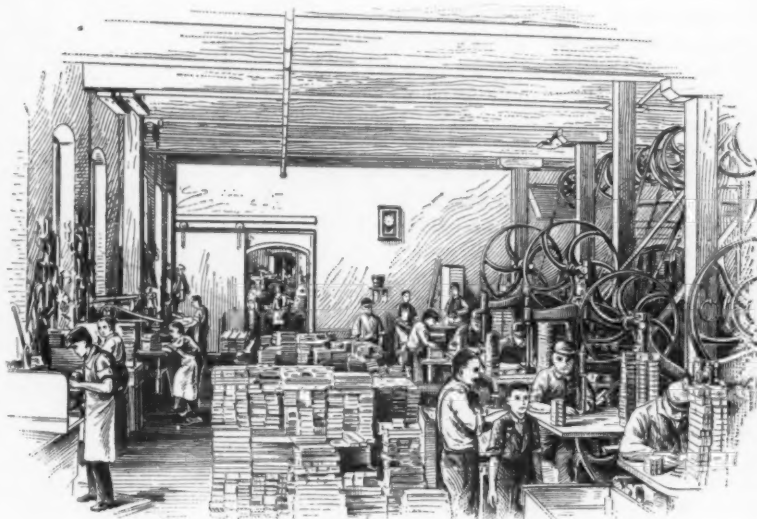


Fig. 16.—A Room in the Handle Factory.

reserved exclusively for their high grade goods, which are never sent out under any other brand.

### From a Retailer's Point of View.

THE following communication will be read with interest, touching, as it does, on some subjects discussed at the recent convention of the Southern Hardware Jobbers' Association:

LOUISVILLE, Ky., June 24, 1900.

In your issue of June 21 you have a very interesting report of the tenth annual meeting of the Southern Hardware Jobbers' Association, and as in the different addresses the retail dealer is very frequently mentioned, he naturally should have some interest in such subjects. I have read the entire proceedings and desire the use of as much space in your valuable paper as is necessary to register a few kicks from the retailer's standpoint. I

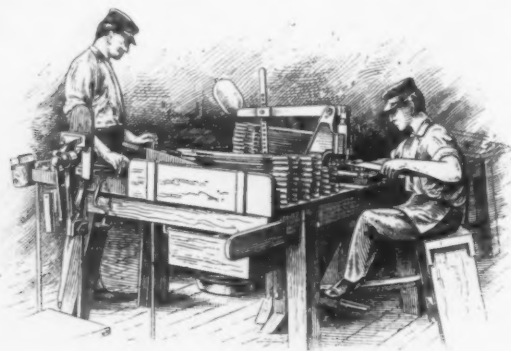


Fig. 17.—Handling.

shall take up the different subjects just as you have them printed, but will touch upon those only in which mention is made of retail dealers.

#### Concerning Department Stores and Catalogue Houses.

In the article by James D. Foot he speaks of department stores and catalogue houses. He believes that manufacturers ought not to be asked not to sell to such houses.

**RETAILER'S STANDPOINT.**—From a retail dealer's standpoint I do not see much objection to selling to such concerns. "But if these department stores and catalogue houses cater to the consumer, I do not think it proper for a manufacturer to sell them goods at the same prices that would be made to a jobber, and, looking through the glasses of the jobber, I do not see why the manufacturer should sell them at all. The retail department and catalogue house should be placed upon the same footing as other retail stores. The department stores and catalogue houses are as much of a detriment to the manufacturer as to the jobbers and retail dealers.

**STANDARD GOODS WITHOUT PROFIT.**—It is necessary for them to handle a few lines of standard goods, but this is done only to blind the purchasers and they are generally sold without profit. As a rule the majority of goods handled by such concerns are of inferior quality and are bought more on account of low price than quality.

**BIG ORDER BAITS.**—But the big order baits of the large department stores are eagerly grabbed at by the manufacturer, who, for the time being, seems to forget his regular feeders.

**ROCKY MOUNTAIN TERRITORY NOT FAIR COMPARISON.**—It is hardly fair for Mr. Foot to class Rocky Mountain Hardware stores with Hardware stores in general. All intelligent Hardware dealers recognize the fact that there is more profit generally in handling goods of good quality.

**DIVERSITY OF HARDWARE TRADE.**—Mr. Foot seems to be surprised that the Hardware trade is becoming so diversified. This is so, but that is no excuse for the jobber who places his goods in the hands of drug stores, groceries, dry goods stores, &c. Taking the jobbers as a whole, no advantage is derived by such practices, as



Fig. 18.



Fig. 19.



Fig. 20.



Fig. 21.



Fig. 22.



Fig. 23.



Fig. 24.

they simply decrease the purchases of legitimate or regular Hardware dealers and kill the goose that lays the golden eggs.

#### Jobbers, Manufacturers and Retailers.

Touching upon the difference in prices charged to retailers and jobbers, I believe that the jobber should be protected by the manufacturer in case he is a jobber in the true sense of the term jobber, but a jobber who retails should receive no benefits not awarded to a retailer.

**MANUFACTURERS SOLICITING RETAIL TRADE.**—In the article upon whether or not a manufacturer is justified in soliciting the retail trade in a locality where he is unable to place his goods with the jobbers, I believe he is, but I believe these orders ought to be placed through the local jobbers, and where it is possible the retail dealer should have the privilege of having his order placed through the jobber of his choice.

**MANUFACTURERS WHO SELL JOBBERS AND RETAILERS IN SAME TERRITORY.**—Mr. Donnan treats in his article

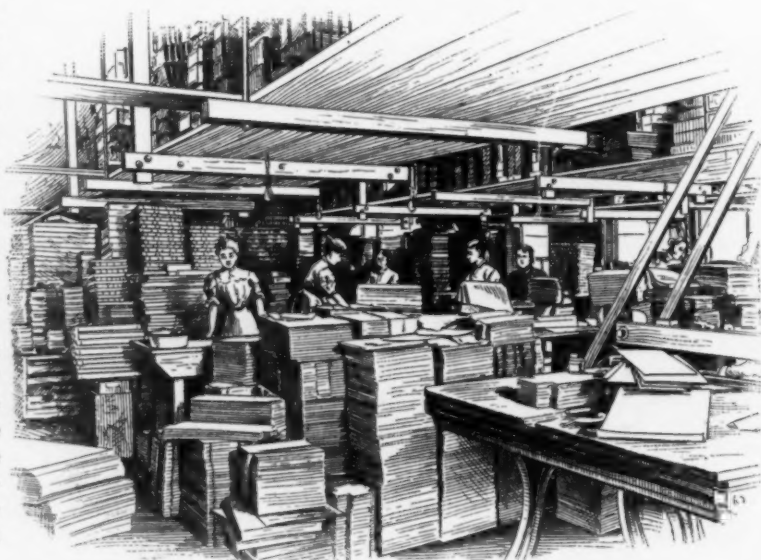


Fig. 25.—Part of the Paper Box Factory.

upon whether or not a manufacturer can sell a jobber and retail dealer in the same territory and conserve both interests very intelligently, but this problem must be worked out between the jobber and manufacturer.

**JOBBERS COMPETING WITH THEIR CUSTOMERS.**—I, of course, heartily agree with that gentleman when he says that in his opinion the jobber has no right whatever to compete with his customer.



**MANUFACTURERS WHO SELL TO CONSUMERS.**—It is not only the jobber, though, that does this. In many instances I regret to say that even the manufacturers become competitors of the retail dealers, especially where good size orders were offered by consumers.

**WHEN JOBBERS LOSE THEIR RIGHT OF WAY.**—Mr. Dornan's definition of a jobber is correct, but when a jobber sells to consumers he, in my estimation, loses his right to be classified as a jobber, consequently he should be treated as a retailer by the manufacturer.

#### Retailers' Struggle to Protect Themselves.

Why does a retailer at times overload himself with goods?

Simply because he desires to buy as low as a local jobber, who is his strong competitor. He must be able to sell as low as this jobber or close up shop.

**RUINATION OF BUILDERS' HARDWARE TRADE FOR THE RETAILER.**—I regret to say that the trade in Builders' Hardware has, in a good many cities, been practically ruined through jobbers and manufacturers selling direct to the consumers at the same prices a retailer would be required to pay.

**COUNTER MOVES FOR SELF PRESERVATION.**—The jobbers may form associations for mutual protection, but they must not lose sight of the fact that retailers all over this broad land are awakening to the fact that the jobbers are slowly encroaching upon their territory, and consequently they are also forming associations. Between the two I firmly believe that the retail association will control the situation.

Yours respectfully,

SAMUEL B. KORB,

Secretary Louisville Retail Hardware and Stove Dealers' Association.

## E. Prentiss Grindstone, Hardware Broker.

### CHAPTER VII.

#### The Tale of a Coat.

**G**ATHERING himself together, Grindstone, Jr., proceeded: "Meeting Dr. Layton in the bank, one day last week, I showed him one of the coats. He looked it over and said if it was as good as the hose it would be all right, and he might get one for his daughter; making an appointment for me to call with ladies' water proofs. When I came he said they were going to Europe shortly, and took the coats to show to the women folks, leaving me in the little private room just off his office. I heard the rustle of a woman's skirts in the hall and the doctor say: "There's an agent here with samples of water proofs; see what you think of them." As they examined them I heard a condemning sniff, then she—it was the daughter—said: "Do you think I would wear such a ridiculous looking thing as that? Why it makes me look like a fright!" Then their voices were lowered and I knew he was telling her not to talk so loud, so I stepped quietly into the front office. Presently they came in, and when she saw me she spoke ever so sweet, and turning to her father, asked where the agent was. Pointing to me, he said, "There he is."

"Mr. Grindstone!" she said, "I'm so surprised. I thought you were one of those—what do you call it men—that make such quick fortunes! Broker! Yes, I thought you were a broker; I had no idea papa's agent was you. Do you know your coats are just lovely and I would like one ever so much, but papa thinks we had better not take much luggage and get what we want in Paris." The doctor looked surprised and was on the point of speaking, but she prevented him, with scant ceremony, rattling on, asking questions about the next Hecla dance. Well, I wasn't in any humor to discuss that subject, so

came away—and it'll be a cold day when I go there again."

#### The Proper Market.

Grindstone, Sr., listened patiently to his son's grievance, his impenetrable countenance breaking into a semblance of a smile at the heat developed in the narrative as the tale progressed. "I think the young lady was right," he said, finally, a faint suspicion of a twinkle in his eye. "You have doubtless heard of the difficulty of making silk purses out of pigs' ears? What you want to do is to take your pigs' ears to pig people," laying an emphasis on the possessive pronoun, which the junior thought entirely unnecessary, conveying, as it did, a reference, ignominiously suggestive, as to the quality of his wares.

#### An Expansionist.

Concealing his resentment as best he could he said, "I have covered the ground pretty well around the shops, so I think I will run up the road to Centre, Pinville and a few other towns to see what I can do with Babbitt and Tools." This in a tone inviting comment. As none came, Grindstone busied himself with preparations for his first trip among strangers.

The single coach on the Pinville accommodation contained the usual class of Monday morning passengers, a barnstorming opera company filling a number of seats with banjos, guitars, woolly dogs and other paraphernalia of their calling; three or four traveling men, detected by their sample cases, and a disposition to possess the world as a whole, and, incidentally, the train and all therein contained. Collecting in a group, it soon became evident that stories of more or less merit were being exchanged. This group was watched with evident interest by a young man seated near the end of the car. The side whiskers adorning his face were, perhaps, not growing as luxuriantly as their possessor wished. This or some other cause made him restless and a bit envious of the unconcern of the traveling men. As the train neared Pinville this nervousness of the young man increased. Finally, when the train came to a stop, his hand trembled visibly as he reached for his grip. In fact, so noticeable was his agitation, it aroused much concern in the mind of a big man wearing blue clothes and a nickel plated star on the lapel of his coat.

#### A Door Hard to Open.

Directing his steps toward the Steel Works, he took from his pocket, as he walked along, a card, reading for the hundredth time the inscription, "E. P. Grindstone, representing Rasp & Co., Files, &c., &c." Upon reaching the works a workman, who was crossing the yard, directed him to a flight of steps, ascending which Grindstone found himself in a long hall, dividing a wareroom from a series of offices, the interiors concealed from the observer by enameled glass, extending from the partition to the ceiling. Walking down this hall, Grindstone read the names on the door plates. Passing the drafting room and half a dozen others, he stopped before a door bearing the legend "Purchasing Department." His heart beat rapidly at the prospect of invading the unknown. What sort of men were behind that door? Would he be received civilly? What should he say? Twice his hand was upon the knob and twice withdrawn. Only by a supreme effort was he prevented from giving up the attack and retreating. At last he pushed the door open and entered. In a large room opening into a smaller, clerks, with sheets of paper in their hands, were passing to and fro. Asking one of these where he could find Mr. Jones, he was shown into the second room and presented his card to a man of dignified bearing, who, after glancing at it, said, "My son attends to the details of our business." Then, calling a boy, Grindstone was conducted to the son, who, in turn, handed him over to the superintendent of construction. To this gentleman Grindstone presented his wares with such eloquence as remained, after his various efforts, with the result that he was permitted to leave one File to be tested.

### Another Attempt.

Much chagrined by his failure, Grindstone walked dejectedly along, passing a small machine shop before noticing it. Retracing his steps he entered and found the proprietor, a young man, working at a lathe. Leaving the shop with an order for \$30 worth of wrenches the world looked a little brighter, and he determined to devote the balance of the day in thoroughly canvassing every shop in town.

### At the Waldorf.

That evening he, with half a dozen other guests of the Waldorf—a comic valentine edition of the famous hostelry of that name—were gathered in the room that did duty as office and general loafing place. One man had a row of charts hung on the wall, which at a distance resembled pictorial advertisements of canned tomatoes, but, upon closer inspection, proved to be colored anatomical plates of the human form divine. The owner of this brilliant outfit was the aristocrat of the assembly. He visited only the educational institutions. The short man with the blond mustache and the I-have-here-sir air assisted the public in becoming familiar with the "Life and Sayings of Senator Doolittle." Grindstone went early to his room; on the way the sound of music drew him toward the dining room, which he found cleared for a dance given by a local club. The day's experience and its associations contrasted but illy with the gay music and laughter of the couples as they swung away in a lively two-step. Before retiring he determined upon a course of action, and arose the next morning fresh and alert.

(To be continued.)

### S. R. Slaymaker.

**S.** R. SLAYMAKER, under date June 20, announces that he has bought from the Slaymaker-Barry Company, Connelville, Pa., of which company he has been president and general manager for the past 12 years, the stock of Locks, Hardware, patents, &c., of their Lock and Hardware departments, as well as their large factory at Lancaster, Pa. In this plant Mr. Slaymaker has placed the most modern equipment for the manufacture of this class of goods, and will make the full line of S. B. Company Padlocks, Door Locks and Hardware, adding new goods from time to time, as the requirements of the trade demand. Mr. Slaymaker states that having a large and well assorted stock very prompt deliveries will be made, and that orders for special Locks will receive careful attention. John H. Graham & Co., 113 Chambers street, New York, are general sales agents for Mr. Slaymaker.

### Marlin Fire Arms Company's Catalogue.

**T**HE MARLIN FIRE ARMS COMPANY, New Haven, Conn., have just issued a new catalogue of 120 pages, illustrating and describing their Repeating Firearms, among which are Rifles, Carbines, Muskets and Shot Guns. It is divided into three sections, Part I being for quick reference of dealers and users of Firearms who desire briefly the details of their Arms. Part II treats in detail information concerning the Arms and their ammunition. Part III gives hints for shooters in general. There are over 300 illustrations, with a cover in six colors designed by Frederic Remington, the drawing representing a typical cowboy mounted on a broncho and armed with a Marlin Repeating Rifle. A copy of the book will be mailed to any one sending 3 cents in stamps for return postage.

### Joseph F. McCoy Company's Catalogue.

**J**OSEPH F. MCCOY COMPANY, 26 Warren street, New York, have issued a catalogue illustrating and describing their goods. Section A, 100 pages, contains Hardware, Cutlery, Chain, Tools, Machinery and Railway Supplies. Section B, 126 pages, describes Railway, Machinists' and Iron Workers' Tools, the two sections being separately indexed. This house were established in 1796 and they manufacture, import and deal in foreign and domestic goods, being also sole agents for

12 well-known foreign manufacturers and headquarters for six others making English, German and French Cutlery, Hardware, House Furnishing Articles, Tools and Saddlery Hardware.

### Barrows Lock Company's Catalogue.

**B**ARROWS LOCK COMPANY, Lockport, Ill., have just issued a fine catalogue of Locks and Builders' Hardware, containing 252 pages, in which is shown in detail the miscellaneous material required to trim and ornament a building whether of public or private character. The list prices are omitted in the catalogue, but shown in a separate pamphlet of 77 pages, there being a column in blank against each item for recording the net cost to the dealer, which is a convenience for ready reference.

### Eagle Lock Company's Catalogue.

**E**AGLE LOCK COMPANY, Terryville, Conn., and 98 Chambers street, New York, have just issued a fine new catalogue of 514 pages, each 8¼ x 11 inches. The book is printed in color, showing the appearance of each Cabinet, Trunk or Pad Lock, as the case may be, and each in its natural color, whether brass, iron, nickel plate, red japanned, &c. The line is an extensive one and includes Locks of this character for almost every purpose, among which are bicycle, billiard, book, buckle, hat box, jewel case, piano, refrigerator, safe deposit, telephone, sub-treasury and other Locks, together with Key Blanks of various kinds.

### Price-Lists, Circulars, &c.

UTICA DROP FORGE & TOOL COMPANY, Utica, N. Y., and 296 Broadway, New York: Mailing card, calling attention to their very extensive line of Pliers, and illustrating particularly their No. 60 End Cutting Nipper.

THE HORNE & DANZ COMPANY, St. Paul, Minn.: Bound catalogue of 126 pages devoted to Picked, Japanned and Stamped Tinware, Wood and Iron Jacket Cans, Lard Pails, Syrup Cans, Oil Tanks, Dairy Supplies, &c.

WOODRUFF HARDWARE COMPANY, Knoxville, Tenn.: Gun and Ammunition catalogue No. 3.

FRANK E. BUNDY LAMP & SUNDRY COMPANY, Elmira, N. Y.: Folder devoted to their Bicycle, Carriage and other Lamps, Headlights for street cars, automobiles and locomotives, Gas Lantern and Search Light designed especially for steam launches and yachts.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: Paint catalogue referring to Paints, Varnishes, Oils, Brushes, Window Glass, &c.

E. R. ALLEN, Corning, N. Y.: Boss Potato Digger, Land, Lawn and Side Path Rollers and Architectural Iron Work, such as Door Plates, Landings, Steps, Railing Posts, &c.

J. B. HUGHES, Greensburg, Ind.: American Corn and Fodder Shock Compressor, for drawing together corn or fodder shocks and holding them until tied.

### Among the Hardware Trade.

The Cutler Hardware Company, Waterloo, Iowa, have recently been incorporated with a capital stock of \$80,000. The company do an exclusively wholesale business, and have five men on the road soliciting trade. They are now comfortably settled in their new building.

The Hardware store of Thomas & Son, Greenfield, Ind., was recently slightly damaged by fire, but there was practically no interruption to business.

W. O. Ash & Co., Hardware dealers, Utah, have disposed of their Tin shop to Graco & Bohne, and will hereafter confine themselves to Hardware and Bicycles.

J. I. Spragg & Co., Cameron, W. Va., have dissolved partnership. J. I. Spragg will continue the business under his own name.

Merimee & Saltsman, New Hope, Ky., have dissolved, and G. E. Merimee continues alone at the old stand. A general line of Hardware and Agricultural Implements is carried.

J. W. Burwell & Co. have sold out their Hardware business, in Sidney, Ind., to the Miller Hardware Company. The latter firm consist of C. C. Miller, H. D. Miller and J. W. Burwell.



Blied Bros., Madison, Wis., have dissolved partnership, and Joseph H. Blied is successor. John J. Blied will re-enter the Hardware business at the head of a new firm, styled Blied, Dufreme & Schneider.

McMillan & Co., Cordele, Ga., have disposed of their business to Cordele Hardware Company, who will continue at the old stand, some improvements in which have been made.

F. A. Autenreith, Yreka, Cal., will remove his Hardware, Stove and Farm Implement business to more convenient quarters.

F. B. Chamberlain, Ellisburg, N. Y., has closed out his Hardware and Stove business at that point.

Bennett & Grist have recently purchased the business formerly conducted by F. M. Rose, Coatesville, Mo.

R. H. De Groodt & Co., Excelsior, Minn., will soon remove to a double store, with tin shop and furniture department. The prospects for business are referred to as good.

Crain & Son have purchased the Hardware, Stove and Farm Implement business of J. G. Rehberg, Summitt, S. D.

F. W. Rincker's store in St. Paul, Neb., was recently damaged by fire. Mr. Rincker expects within a short time to occupy a new and attractively fitted up store.

C. K. Brown & Son have succeeded C. K. Brown in the sale of Agricultural Implements in Cozad, Neb.

R. H. Lackey is successor to Van Sickel & Lackey, Garber, O. T.

Alfred D. McBryde has closed out his Hardware business in New Orleans, La.

G. W. Snapp Hardware Company have purchased the business formerly carried on by Miller & Gaston, Maryville, Mo.

J. B. Horsley has purchased the interest of T. J. Mott in the Hardware firm of Lawson & Sears Hardware Company, Union City, Tenn.

A. B. Tucker & Sons, Randolph, Neb., have sold out to Usher & Brenner.

A. O. Dunlap has recently opened up in the Hardware business in Springville, Pa.

The De Kalb Hardware & Furniture Company have purchased the business of the De Kalb Grain & Lumber Company, De Kalb, Mo.

Perry & Son are successors to Clark & Gallup, dealers in Agricultural Implements, Wagons, Buggies, Harness, &c., Prattville, Mich.

The Belt Hardware Company, Belt, Mont., are erecting a fine modern stone building, 30 x 100 feet, for the accommodation of their business.

H. J. Bohlman has succeeded Buckman & Bohlman in the general merchandise business, at Berlin, Neb.

### New Washing Machine.

The Anthony Wayne Mfg. Company, Fort Wayne, Ind., and St. Louis, Mo., have brought out a new rotary washing machine, which it is expected will be ready for the market in about two weeks. They are running their plant with about the usual complement of hands, operating nine hours per day.

### Palmtag Adjustable Brush Holder

Palmtag & Stull Specialty Works, 39-43 West Washington street, Chicago, Ill., for whom Hendricks & Class, 150 Nassau street, New York, are sales agents, have introduced to the trade the Palmtag adjustable brush holder, shown in Fig. 1. The holder is made of cast iron, brown enameled, is  $4\frac{1}{2}$  inches long over all, and can be adjusted to seven distinct positions through about two-thirds of a circle. The socket,  $\frac{3}{4}$ -inch diameter at its large end, is threaded to receive the average handle, the other end of the holder being threaded outside to screw into a duster, window or whitewash brush or anything of a similar character. The point made is that

with this device otherwise inaccessible places can be reached for a multitude of purposes while standing on the floor and without the aid of chairs, ladders or other



Fig. 1.—Palmtag Adjustable Brush Holder.

conveniences. It is recommended by the manufacturers, among other uses, for window cleaning, whitewashing, painting or on railroads, in factories and mills, or

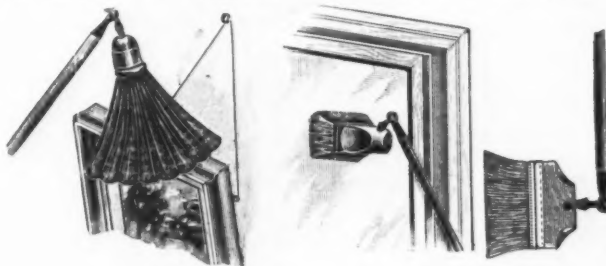
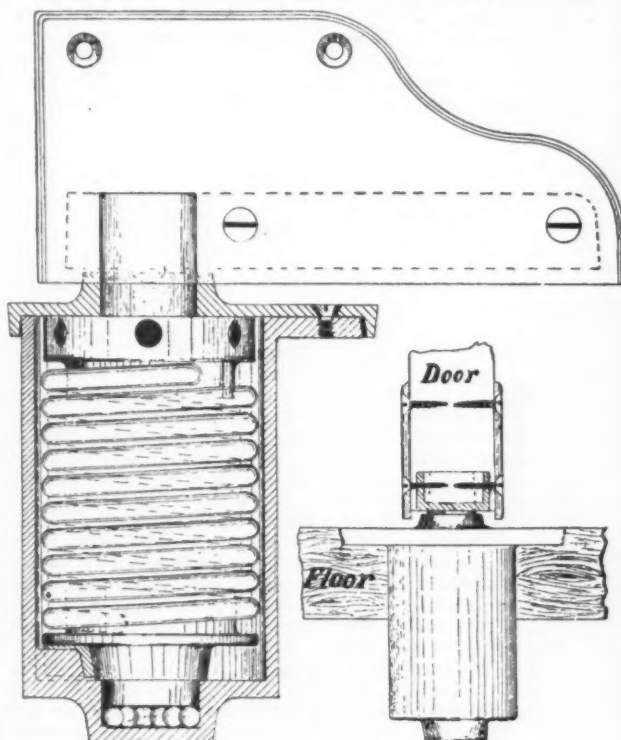


Fig. 2.—Some Ways of Using Holder.

wherever brushes are used, Fig. 2 showing some of the uses to which it can be put.

### The Superior Double Acting Floor Spring Hinge.

Coleman Hardware Company, 59 Dearborn street, Chicago, Ill., are offering the double acting floor spring hinge herewith illustrated. In the large cut, part of the



The Superior Double Acting Floor Spring Hinge.

cylinder is omitted to show the construction. The hinge has an adjustable tension, and the door works on a ball bearing pivot. It is pointed out that the hinge has a broad bearing on the floor, and that, being cylindrical in shape, it can be easily fitted in the floor. The hinge is made for doors of different thicknesses, and in a number of finishes.

### Hoggson Pocket Time Stamp.

S. H. Hoggson & Co., 267 West Seventeenth street, New York, are manufacturing the Hoggson pocket time stamp, here illustrated half size, the dials in Fig. 2 being actual size. With this stamp can be recorded on documents, letters, telegrams, &c., the exact minute of their receipt, giving the year, month, day, hour and minute. It prints directly from rubber dies in any colored ink desired, in the same manner as ordinary hand

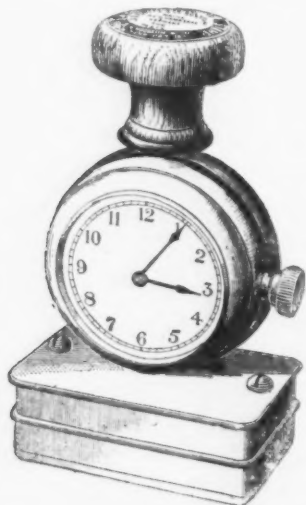


Fig. 1.—Hoggson Pocket Time Stamp.

stamps, giving a clear, clean impression. In use it is only necessary to wind the timepiece and set the day once in 24 hours. Any wording required, which can be placed within the limits of the die bed ( $1\frac{1}{2} \times 2\frac{1}{2}$  inches) and surrounding the time dials, can be added to suit the purchaser. The two time dials record the hours and minutes. The hour dial registers from 12 a.m. to 12 m. and 12 m. to 12 p.m. An imaginary horizontal line through the center of the dial shows the day hours above and the night hours below, while a similar vertical line would divide the a.m. and p.m. hours. The other dial registers the minutes. The rubber dies from which the impression is made are placed on a rubber air cushion, and the arrows are recessed, so that only when pressure is applied to the stamp do they touch a surface, thus giving perfect impressions on uneven surfaces. The color of

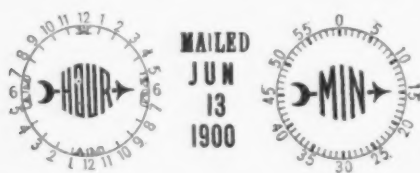


Fig. 2.—Fac simile of Impression.

the ink can be changed as frequently as desired by substituting another pad and pressing the stamp a few times on blotting paper to exhaust any remaining ink on the stamp. The timepiece is made of specially heavy movements for this particular purpose and the watch is guaranteed by the makers to be a correct and reliable timekeeper. The movement is connected with the movable air cushioned rubber hour and minute hands in the base of the stamp by a simple mechanism. The watch is stem winding and stem setting, and, if allowed to run down, can be set the same as an ordinary watch. The stamps are packed in a case containing ink pad (any color ink required) and box of 10 years, 12 months and 31 days. Extra logotypes, such as "Ent'd," "Filed," "Sent," "Rec'd," "Acp'd," "Paid," "Ans'd," or other words, letters or figures designating location or proprietor can be furnished. The stamp is but  $4\frac{1}{2}$  inches high, weighs 10 ounces and can be carried in the pocket if necessary.

### The Collins Lumber Tally and Register.

The accompanying illustration is of a lumber tally and register offered by Moore Bros., Ravenswood, W. Va. The register is held in the left hand, with the forefinger resting on the left hand end of the scale, near number 10, and the thumb against the right hand side

of the indicator lever. A board is measured with an ordinary lumber rule to ascertain the number of feet it contains, when the indicator lever is pushed across the scale to the number corresponding with the number of feet in the board. This causes a small pointer which runs around the edge of the dial to register the number of feet on the large dial. When the indicator lever is released it automatically returns to its normal position at 0. Should the number of feet in the board exceed 10 the lever is pushed across the scale and allowed to return to 0, when the lever is pushed to a figure which added to 10 will give the required amount of feet. For instance, if it is desired to register 17 feet the lever is pushed to 10 and then to 7, when 17 will be registered. The large dial registers up to 100, and the smaller dials register hundreds, thousands and tens of thousands respectively. The back of the register is so arranged that it may be attached to a lumber rule, near the handle, so that the measuring and registering can be done with one hand. The register is recommended by the manufac-

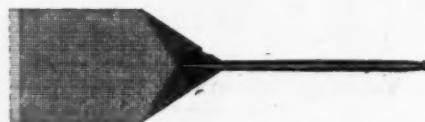


The Collins Lumber Tally and Register.

turers for use in lumber yards and wherever an accurate count and tally is demanded. It is remarked that the register will keep an absolutely accurate account or tally as rapidly as lumber can be handled, showing at any time the precise number of feet measured; that it entirely dispenses with the tedium of long calculations at the end of a day's work, and that the register can be operated successfully with heavily gloved hands in the most severe weather. The manufacturers state that the register has met with the unqualified approval of lumbermen who have seen it.

### The 'King Fly Killer.

The cut herewith shown represents a fly killer, put on the market by R. R. Montgomery & Co., Decatur, Ill. The blade or paddle, made of narrowly woven wire cloth, is secured to a light handle. The screen wire being practically invisible, it is explained, and the fly not be-



The King Fly Killer.

ing disturbed by a rush of air as the killer is brought into action, its purpose is served quickly and effectively. It is pointed out that the killer does not crush the fly, consequently the most delicate fabric will not be injured by its use.

The Baird Hardware Company, Baird, Texas, have sold out to R. E. Hadley, who has added largely to the stock thus acquired.



### Schroeder's Hangers and Fasteners.

Stanley Works, New Britain, Conn., and 79 Chambers street, New York, are manufacturing Schroeder's locking non-rattling hangers and fasteners as here illustrated. They are intended for use in connection with storm sash, awnings and screens. Fig. 1 shows the method of using either the visible or invisible hangers in



Fig. 1.—Schroeder's Locking and Non-Rattling Hanger and Fastener.

connection with storm sash or all over window screens. Fig. 2 is a sectional view of storm sash and window frame, illustrating the application of the visible hanger, Fig. 3 being a similar presentation of the invisible hanger, while Fig. 4 represents Schroeder's patent fastener

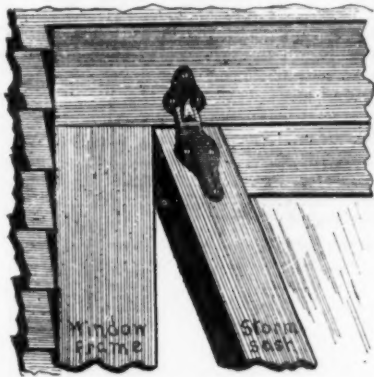


Fig. 2.—Style of Visible Hanger.

for securing storm sash or screen to window frame or holding the bottom end outward as in Fig. 1, so the windows may be cleaned. With either of these hangers the sash or screen can be removed instantly if necessary by simply unhooking at the top. The visible hangers,

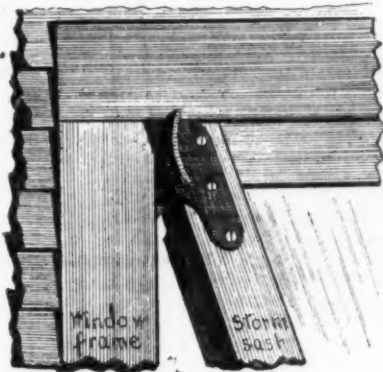


Fig. 3.—Style of Invisible Hanger.

Fig. 2, are screwed to the window frame and top of storm window or screen, the invisible hanger in Fig. 3 being applied in another manner as shown. When closed the fastener hangs against the side of the window frame with a pin projecting through the lower end of

the slot to prevent swinging of the fastener. When it is desired to open the window the lower end of the fastener strip is pulled outward to release it from the pin, and the window is then pushed outward to open position in the ordinary manner. As the window is moved to open position the fastener turns upon its pivot, the fastener sliding on the screw, the head of which is larger than the slot to prevent detachment. The window is turned outward until the screw reaches the upturned end of the slot, allowing the fastener to drop to carry the screw into the upturned end, and this holds the fastener in extended position. When it is desired to close the window the finger end of the fastener is lifted sufficiently to

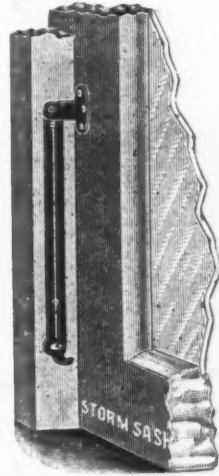


Fig. 4.—Schroeder's Patent Fastener.

bring the screw down to the body of the slot, when the window will slide to closed position by its own weight and turn the hanger downward into the position shown in the illustration. An enlargement is formed in the slot through which the head of the screw may be passed to allow the detachment of the fastener. The hangers are made from sheet steel, japanned, and are both light and strong. The fasteners are made from steel and are 10 inches long.

### Self Fastening Folding Saw Clamp.

The accompanying illustrations show two views of a self fastening folding saw clamp, put on the market by Gunn & Hannah, Pittsburgh, Pa. The manufactur-

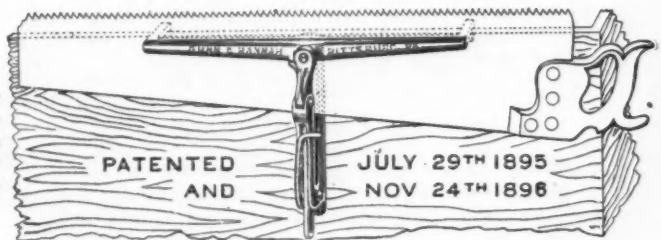


Fig. 1.—Self Fastening Folding Saw Clamp.

ers state that it will instantly fasten itself to a work bench, saw horse, tool box, window sill, the edge of a board, plank, joist, stick of timber, pile of lumber, rail of a fence, or any other suitable place, without the aid of screws or nails. The clamp is half the length of a rip

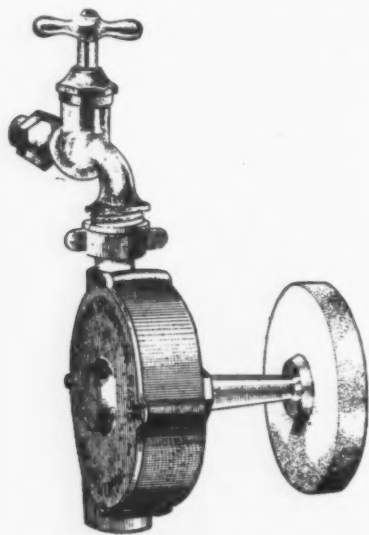


Fig. 2.—Saw Clamp Folded

saw, weighs  $3\frac{1}{2}$  pounds, and is referred to as being made of best cast malleable iron, warranted not to break. Another claim made for the clamp is that it can be folded up like a jack knife and carried in the coat pocket and occupies but little more space in a tool box than a hatchet or claw hammer.

### Little Wonder Water Motor.

The Warner Motor Company, Northampton, Mass., are manufacturing the Little Wonder water motor, as here illustrated, which shows the motor attached by means of a hose coupling to an ordinary threaded faucet. The motor consists of a circular shell of cast iron, with a side plate, the outer dimensions of which are  $4\frac{1}{4} \times 1\frac{1}{2}$  inches. In this shell is an iron water wheel, to which is attached a brass shaft fitted with beveled brass washers, between which an emery wheel or buff is secured with a hexagon nut, the shaft operating inside of a brass casing. The emery wheel is  $4 \times \frac{1}{2}$  inches in dimensions and the cloth buff the same diameter. This device can be quickly coupled to any standard hose bibb in shop, kitchen sink or anywhere where water pressure is obtainable, whether through the medium of a regular

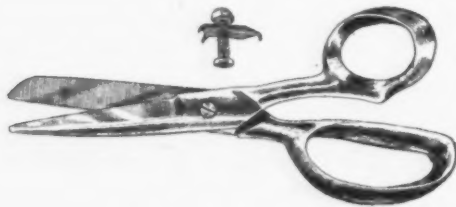


*Little Wonder Water Motor.*

water works or isolated tank pressure. A high speed is readily obtained at an average pressure, and easily modified by a turn of the faucet key. This motor can be used in countless ways for light work, such as sharpening cutlery, tools, &c., polishing and buffing silverware, metals and other surfaces, in hotels, restaurants, boarding houses, private residences, institutions, &c., and propelling cooling fans, as well as by dentists, jewelers and others for light work. The water passes through the faucet over the water wheel and out at the bottom, as shown in the engraving. It is handled in New York by Charles E. Miller, 97-101 Reade street, wholesale dealer in cycle fittings, parts, sundries, &c.

### The Lang Tension Shear.

The Lang Cutlery Company, Cedar Rapids, Iowa, are offering the shear shown herewith. An important feature of the shear is the bolt, which has a right and left



*The Lang Tension Shear.*

hand thread to prevent it from working loose. The tension spring, shown in the smaller cut, is also an important feature, and is designed to take up the wear. The shear is made in oval pattern, which is referred to as improving its appearance.

Popejoy & Gavin have dissolved partnership in the Hardware, Stove and Farm Implement business, at Poneto, Ind., and Wm. A. Popejoy is continuing under his own name. Mr. Popejoy is at work on a new store

room, two stories high, 30 x 75 feet, which will be completed within 60 days.

Yowell & Covington have succeeded J. W. Yowell & Co., Culpeper, Va. Shelf and Heavy Hardware, Stoves, Tinware, &c., are handled at wholesale and retail. Business is referred to as good. The new owners have purchased a new three-story brick building, 44 x 90 feet in dimensions.

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# Current Hardware Prices.

REVISED JUNE 26, 1900.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Cut Prices.**—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 8, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00...\$3.40@3.90  
North's...1.00  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent...25¢  
Taplin's Perfection...50¢

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvil...\$7.75@7.90  
Hay-Budden, Wrought...9.90@9.95  
Horseshoe brand, Wrought...9.90@9.95  
Barnson...\$7.75@7.90  
Trenton, Wrought...\$7.75@7.90

## Imported—

Armitage's Mouse Hole...8.90@9.40  
Peter Wright's...9.90@9.95

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00...20¢

## Apple Parers—See Parers, Apple, &c.

## Augers and Bits—

Common Double Spur...60¢@1.00  
Boring Machine Augers...60¢@1.00

Car Bits, 12-in. twist...60¢@1.00

Jennings' Pattern: Auger Bits...60¢@1.00

Ford's Auger and Car Bits...40¢@1.00

Forstner Pat. Auger Bits...25¢

C. E. Jennings & Co.: No. 10 ext. lip, R. Jennings' list...40¢@1.00

No. 30, R. Jennings' list...50¢@1.00

Russell Jennings': No. 10 ext. lip, R. Jennings' list...50¢@1.00

L'Hommiedieu Car Bits...15¢@1.00

Pugh's Jennings' Pattern...35¢

Snell's Auger Bits...60¢

Snell's Bell Hangers' Bits...60¢

Snell's Car Bits, 12-in. twist...60¢

Wright's Jennings Bits (R. Jennings' list)...50¢

## Bit Stock Drills—

Standard list...65¢@65¢

## Expansive Bits—

Clark's small, \$18; large, \$26...50¢@1.00

Lavigne's Clark's Pattern, No. 1,  $\frac{1}{2}$  doz...50¢@1.00

Steele's No. 1, \$26; No. 2, \$18...40¢@1.00

Swan's...60¢

## Gimlet Bits—

Common Double Cut, gro...\$2.75@3.25

German Pattern...gro...\$5.00@5.50

Double Cut, makers' lists...50¢@50¢

## Hollow Augers—

Ames...25¢@1.00

Bonney's Adjustable,  $\frac{1}{2}$  doz...\$10.00

New Patent...25¢@1.00

Universal...20¢

## Ship Augers and Bits—

Ford's...40¢

Snell's...40¢

L'Hommiedieu's...15¢@1.00

Watrous's...40¢@40¢

## Awl Hafts, See Hafts, Aul.

## Awls—

Brad Awls: Handled...gro...\$2.75@5.10

Unhandled, Shouldered, gro...65¢@65¢

Unhandled, Patent...gro...60¢@70¢

Peg Awls: Unhandled, Patent...gro...31¢@35¢

Unhandled, Shouldered, gro...65¢@70¢

Scratch Awls: Handled, Common...gro...\$5.50@4.00

Handled, Socket...gro...\$11.50@12.00

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First Quality, best brands...\$6.25@6.50

First Quality, other brands...\$6.00@6.25

Jobbers' Special Brands: Good Quality...\$5.00@5.50

Best Quality...\$6.25

Cheap, Handled Axes...\$5.50@5.75

Beveled, ad 25¢ doz.

Axle Grease—See Grease, Axle.

## Axles—

Concord, loose collar...\$1.40 6 c

Concord, solid collar...6.40 6 1/2 c

No. 1 Common...5 c 1 1/2 c

No. 1 1/2 Com. New Style...5.40 5 1/2 c

No. 2 Solid Collar...5.40 5 1/2 c

Nos. 7, 8, 11 to 14, 100 sets...60¢@1.00

Nos. 7, 8, 11 to 14, 100 sets...60¢

Nos. 15 to 19...60¢@1.00

Nos. 19 to 22...60¢@1.00

Common and Concord, not turned...15, 50

Common and Concord, turned...lb. 60

Half Patent...lb. 90

## Balances—

Caldwell new list...50¢

Fullman's...62 1/2¢

Spring Balances...60¢@50¢

Chatillon's Light Spz. Balances...40¢@1.00

Chatillon Straight Balances...40¢

Chatillon Circular Balances...50¢

Chatillon's Large Dial...30¢

Barb Wire—See Wire, Barb.

Bars—Crow: Steel Crowbars, 10 to 14 lb., per lb...3 1/4¢@4¢

Beams, Scale: Scale Beams, list Jan. 12, '99...30¢@30¢

Chatillon's No. 1...30¢

Chatillon's No. 2...40¢

Beaters—Egg: Standard Co.: No. 5 Steel Handle Dover...\$6.50

No. 10 Cast Handle Dover...\$5.00

No. 10 Steel Handle Dover...\$2.00

No. 15 Extra Heavy Steel Handle...\$15.00

Rival,  $\frac{1}{2}$  gro...\$10.00

Taplin Mfg. Co.: No. 50 Small Family size...\$5.50

No. 100 Regular Family size...\$3.00

No. 102 Regular Family size, tinned...\$9.50

No. 150 Large Family size...\$15.00

No. 152 Large Family size, tinned...\$12.00

Lyon's Standard...\$17.75

Wonder (S. S. & Co.)...\$7.50

Bellows—Blacksmith: Standard list...70¢@70¢

Inch...\$3.75 3.25 3.50 3.75 4.00

Each...\$3.75 3.25 3.50 3.75 4.00

Extra Length: Each...\$4.25 4.50 4.75 5.00 5.25 5.50 5.75 6.00 6.25 6.50 6.75 7.00

Molders: Inch...6 7 8 9 10 12

Doz...\$3.75 4.25 4.50 5.00 5.50 6.00 6.50 7.00

Hand: Inch...6 7 8 9 10 12

Doz...\$3.75 4.25 4.50 5.00 5.50 6.00 6.50 7.00

Bells—Cow: Ordinary goods...75¢@1.00

High grade...70¢@70¢

Jersey...75¢@1.00

Texas Star...50¢@1.00

Door: Barton G'ng...55¢

Gong, Yankee...55¢

Horn, R. & E. Mfg. Co.'s...50¢@1.00

Lever and Pull, Sargent's...33 1/2¢@1.00

Hand Bells: Polished...65¢@65¢

White Metal...65¢@65¢

Nickel Plated...60¢@60¢

Swiss...60¢@60¢

Miscellaneous: Farm Bells...lb. 2 1/2¢

Steel Alloy Church and School...50¢@1.00

Wilmot & Hobbs Mfg. Co., Gongs...70¢

Belting Rubber: Common Standard...70¢@75¢

Standard...60¢@70¢

Extra...60¢@60¢

High Grade...60¢@60¢

Leather: Extra Heavy, Short Lap...50¢@50¢

Regular Short Lap...60¢@60¢

Standard...60¢@60¢

Light Standard...70¢

## Cotton—

Rossendale-Reddaway B. & H. Co.: Sphinx Brand...60¢@1.00

Durable Brand...70¢

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire: Green River Tire Benders and Upsetters...20¢

Ill. Iron & Bolt Co...40¢@40¢

Stoddard's Lightning Tire Upsetters...40¢@50¢

Bicycle Goods: Lane's Cycle Hanger...33 1/4¢@5¢

John S. Leung's Son's 1899 list: Chain...50¢

Spokes...50¢

Tub...60¢

Bits: Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—Tackle: Common Wooden...70¢@70¢

Cleave and Steel...50¢@1.00

Eddy's steel...60¢@1.00

Hartz Steel...50¢@1.00

Ford's Star Brand Self Lubricating...50¢@1.00

Hollow Steel, Ford's Pat. Star Brand...50¢@1.00

Lane's Patent Automatic Lock and Junior...30¢

Stowell's Novelty, Mal. Iron...50¢

See also Machines, Hoisting.

Boards, Stove: Zinc, Crystal, &c...50¢@50¢

Boils: Carriage, Machine &c.—Common list Jan. 30, '95, 20¢@1.00

Norway Iron, \$3.00, list Oct. 7, '98...75¢@75¢

Phila. Eagle, \$3.00 list May 24, '99...75¢@75¢

75¢@75¢

Boil Ends, list Jan. 30, '95, 70¢@1.00

Machine, list Oct. 1, '99...70¢@1.00

Note:—Jobbers' prices on Boils are now generally lower than manufacturers', and the market is irregular.

Door and Shutter: Cast Iron Barrel, Round Brass Knob: Inch...3 4 5 6 8

Per doz...\$3.35 3.50 4.50 5.75 8.00

Cast Iron Spring Foot: Inch...6 8 10

Per doz...\$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned: Inch...6 8 10

Per doz...\$0.85 1.00 1.50

Cast Iron Shutter, Brass Knobs: Inch...6 8 10

Per doz...\$0.60 1.00 1.15

Wrought Barrel Brass Knob: Inch...3 4 5 6 8

Per doz...\$0.45 1.00 1.25

Wrought Barrel: Wrought...70¢@70¢

Wrought...Bronzed...60¢@60¢

Wrought Flush, B. K...50¢@1.00

Wrought Shutter...60¢@60¢

Wrought Square Neck...50¢@50¢

Wrought Sunk...50¢@50¢

Ives' Patent Door...63 1/4¢@1.00

Stove and Plow: Plow...50¢@60¢

Stove...60¢@60¢

Tire: Common...60¢@60¢

American Screw Company: Norway Phila., list Oct. 16, '84...70¢

Eagle Phila., list Oct. 16, '84...72 1/2¢

Bay State, list Dec. 28, '90...57 1/2¢

Franklin Moore Co.: Norway Phila., list Oct. 16, '84...70¢

Eagle Phila., list Oct. 16, '84...72 1/2¢

Empire, list Dec. 28, '90...57 1/2¢

Keystone Phila., list Oct. '84...72 1/2¢

Norway Phila., list Oct. '84...70¢

## Borers, Tap—

Borers Tap, Ring, with Handle: Inch...1 1/4 1 1/2 1 3/4

Per doz...\$3.50 4.50 5.00 6.00

Per doz...\$3.50 4.50 5.00 6.00

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each...25¢@30¢

Boring Machines—See Machines, Boring.

## Boxes, Mitre—

Seavey's, per doz., \$30...40¢

## Braces—

Note:—Most Braces are sold at net prices.

Common Ball, American...\$1.10@1.50

Barber's...50¢@1.00

Frays's Genuine Spoutford's...50¢@1.00

Frays's No. 70 to 120, 81 to 123, 207 to 414...50¢@1.00

P. S. & W. Co., Peck's Patent...50¢@1.00

50¢@1.00

## Brackets—

Cast Iron, plain...60¢@1.00

Wrought Steel...70¢@70¢

Bradley's Wire Shelf: Full cases...75¢@1.00

Broken cases...75¢

Bright Wire Goods—See Wire and Wire Goods.

## Broilers—

B. L. Caps (Sturtevant Shells)  
\$1.00.....\$1.10 to \$1.15  
All other primers.....\$1.10 to \$1.15

### Carpet Stretchers— See Stretchers, Carpet.

### Cartridges—

B. B. Caps, Con., Ball Swgd. ....\$1.90  
B. B. Caps, Round Ball.....\$1.12 to \$1.18  
Blank Cartridges:  
33 C. F. \$5.50.....10¢ to 5¢  
33 C. F. \$7.00.....10¢ to 5¢  
33 cal. Rim, \$1.50.....10¢ to 5¢  
33 cal. Rim, \$2.75.....10¢ to 5¢  
Central Fire.....5¢  
Pistol and Rifle.....15¢ to 5¢  
Primed Shells and Bullets.....15¢ to 5¢  
Rim Fire Sporting.....50¢  
Rim Fire Military.....15¢ to 5¢

### Casters—

Bed.....60¢ to 10¢ to 70¢  
Plate.....60¢ to 10¢ to 70¢  
Philadelphia.....70¢ to 10¢ to 70¢  
Boss.....70¢ to 10¢  
Boss Anti-Friction.....70¢ to 10¢  
Martin's Patent (Phonix).....45¢  
Payson's Anti-Friction Furniture.....70¢ to 10¢  
Payson's Anti-Friction Truck.....70¢ to 10¢  
Standard Ball Bearing.....45¢  
Tucker's Patent, low list.....90¢

### Cattle Leaders— See Leaders, Cattle.

### Chain—

American Coil, Full Casks:  
5-16 ¼ 5-16 ¾ 7-16 ¼ 8-16 ¼  
7-9 6.00 6.00 4.15 4.00 3.90 4.40  
¾ ¾ ¾ 1 inch.  
8-70 3.05 3.55 3.55 cents per lb.  
Less than Cask lots add 40¢ per 100 lbs.  
German Coil, list July 24, '97.....

German Hailer Chain, list July 24, '97.....

Traces, Western Standard: 100 pair  
6½-6-3, Straight, with ring.....\$23.00  
6½-6-2, Straight, with ring.....\$29.50  
6½-8-2, Straight, with ring.....\$33.00  
6½-10-2, Straight, with ring.....\$37.00  
Add 2¢ per pair for Hooks.  
Twist Traces 2¢ per pair higher than  
Straight Link.

Trace, Wagon and Fancy Chains,  
list April, '93.....50¢ to 10¢ to 50¢ to 5¢

Jack Chain, list July 10, '93:

Iron.....60¢ to 50¢ to 5¢  
Brass.....60¢  
Gal. Pump Chain.....lb 50¢ to 5¢  
Breast, Hitching and Rein Chains.....50¢  
Covert Saw, Works.....50¢

Covert Mfg. Co.:  
Breast.....35¢ to 25¢  
Halter.....35¢ to 25¢  
Heel.....35¢ to 25¢  
Rein.....35¢ to 25¢  
Stallion.....35¢ to 25¢

Onida Company:  
Eureka Coil and Filter.....60¢ to 50¢ to 5¢  
Niagara Coil and Filter.....60¢ to 50¢ to 5¢  
Niagara Cog Ties.....45¢ to 45¢ to 10¢ to 5¢  
Am. Coil and Halters.....50¢ to 10¢ to 5¢ to 5¢  
Am. Cow Ties.....35¢ to 5¢ to 40¢ to 5¢

Wire Goods Co.:  
Dog Chain.....60¢  
Universal Dbi-Jointed Chain.....45¢

### Chalk—(From Jobbers.)

Carpenters', Blue.....gro. 45¢  
Carpenters', Red.....gro. 35¢  
Carpenters', White.....gro. 30¢  
See also Crayons.

### Chalk Lines—See Lines.

### Checks, Door—

Bardsley's.....40¢ to 10¢  
Columbia.....50¢ to 10¢  
Zellips.....60¢ to 50¢ to 10¢

### Chisels—

Socket Framing and Firmer  
Standard List.....70¢ to 5¢  
Buck Bros.....30¢  
Charles Buck.....30¢  
L. & J. White.....30¢ to 25¢

### Tanged—

Tanged Firmers.....40¢ to 5¢ to 40¢ to 10¢  
Buck Bros.....30¢  
Charles Buck.....30¢  
L. & J. White, Tanged.....25¢ to 5¢

### Cold—

Cold Chisels, good quality lb. 1½ lb. 16¢  
Cold Chisels, fair quality.....lb. 12¢  
Cold Chisels, ordinary.....lb. 8¢ to 9¢

### Chucks—

Beach Pat., each \$3.00.....20¢  
Kinner Patent Chucks:  
Combination Lathe Chucks.....40¢  
Drill Chucks, Patent and Standard 30¢  
Drill Chucks, New Model.....25¢  
Independent Lathe Chucks.....40¢  
Improved Planer Chucks.....20¢  
Universal Lathe Chucks.....40¢  
Face Plate Jaws.....35¢  
Standard Tool Co.:  
Improved Drill Chuck.....45¢  
Union Mfg. Co.:  
Combination.....40¢  
Czar Drill.....30¢  
Geared Scroll.....30¢  
Independent.....30¢  
Union Drill.....30¢  
Universal.....40¢  
Face Plate Jaws.....35¢

### Clamps—

Adjustable, Hammers.....20¢ to 20¢ to 5¢  
Adjustable, Stearns.....30¢  
Cabinet, Sargent's.....45¢ to 10¢  
Carriage Makers', P. S. & W. Co. 40¢ to 10¢  
Carriage Makers', Sargent's.....60¢ to 10¢  
Beal, Parallel.....33¢ to 10¢  
Lineman's, Uica Drop Forge & Tool Co. 40¢  
Saw Clamps, see Vises, Saw Filers.

### Cleaners, Walk—

Star Socket, All Steel.....\$ doz. \$4.00 net  
Star Shank, All Steel.....\$ doz. \$3.75 net

### Cleavers, Butchers—

Foster Bros.....37¢  
New Haven Edge Tool Co.'s.....40¢ to 40¢ to 37¢

Nichols Bros., Flat hdl., 80%; Rd. hdl., 50%  
Payette R. Plumb.....25¢  
P. S. & W.....33¢ to 50¢ to 35¢  
L. J. White.....35¢

### Clippers—

Chicago Flexible Shaft Company:  
Handy Toilet.....\$ doz. \$7.80  
Masotte Toilet.....\$ doz. \$3.40  
Monitor Toilet.....\$ doz. \$9.00  
Stewart's Patent.....\$ doz. \$10.00

### Clips, Axle—

Eagle and Superior ¼ and 5-16  
inch.....65¢ to 10¢ to 70¢  
Norway, ¼ and 5-16 inch.....65¢ to 5¢ to 5¢

### Cloth and Netting, Wire— See Wire, &c.

### Cocks, Brass—

Hardware list (Globe, Kerosene,  
Lever Bibbs, Racking, &c.).....70¢ to 5¢ to 70¢ to 10¢

### Coffee Mills—See Mills, Coffee.

### Collars Dog—

Brass, Pope & Stevens' list.....40¢  
Embossed, Gilt, Pope & Stevens' list 50¢ to 10¢  
Leather Pope & Stevens' list.....40¢

### Compasses, Dividers, &c.—

Ordinary Goods.....70¢ to 10¢ to 7¢  
Bemis & Call Hdw. & Tool Co.:  
Dividers.....85¢  
Callipers, Call's Patent Inside.....85¢  
Callipers, Double.....85¢  
Callipers, Inside or Outside.....85¢  
Callipers, Wing.....85¢  
Compasses.....50¢  
J. Stevens A. & T. Co.....55¢ to 10¢

### Conductor Pipe, Galva- nized—

Carload.....L. C. L.  
Territory.....Loose.....Nested.  
Eastern.....60¢ to 25¢ to 5¢ 60¢ to 25¢ to 5¢  
Central.....60¢ to 25¢ to 5¢ 60¢ to 17¢ to 5¢  
Southern.....60¢ to 25¢ to 5¢ 60¢ to 15¢ to 5¢  
S. Western.....60¢ to 20¢ to 5¢ 60¢ to 13¢ to 5¢  
Terms: 2½ for cash.

### Coolers, Water—

S. S. & Co.: 2-gal. \$14.00; 3-gal.  
\$16.00; 4-gal. \$18.50; 6-gal. \$23.00.

### Coopers' Tools—

See Tools, Coopers'.

### Cord—Sash—

Braided, Drab.....lb. 25¢ to 5¢  
Braided, White, Common.....lb. 15¢ to 13¢  
Cable Laid Italian.....lb. A, 15¢; B, 16¢  
Common India.....lb. 8¢ to 9¢ to 5¢  
Cotton Sash Cord, Twisted.....12¢ to 10¢  
Patent Russia.....lb. 12¢ to 10¢  
Cable Laid Russia.....lb. 12¢ to 10¢  
India Hemp, Braided.....lb. 11¢ to 10¢  
India Hemp.....lb. 10¢ to 10¢  
Patent India.....lb. 10¢ to 10¢  
Pearl Braided, cotton.....lb. 10¢ to 10¢  
Massachusetts, White.....lb. 22¢ to 18¢  
Massachusetts, D. ab.....lb. 20¢ to 18¢  
Eddystone Braided Cotton.....lb. 14¢  
Harmony Cable Laid Italian.....lb. 18¢  
Oswego Mills:  
Crown, Solid Braided White.....lb. 18¢  
Braided, Giant, White.....lb. 17¢  
Peerless:  
Cable Laid Italian.....16¢  
Cable Laid Russian.....14¢  
Cable Laid India.....14¢  
Braided India.....18¢  
Phoenix, White.....19¢  
Samson:  
Braided, Drab Cotton.....lb. 39¢ to 34¢  
Braided, Italian Hemp.....lb. 32¢ to 34¢  
Braided, Linen.....lb. 32¢ to 34¢  
Braided, White Cotton, Spot.....lb. 28¢ to 34¢  
Silver Lake:  
A quality, Drab, 40s.....15¢  
A quality, White, 35s.....15¢  
B quality, Drab, 35s.....15¢  
B quality, White, 30s.....15¢  
Italian Hemp, 40s.....15¢  
Linen, 57s.....15¢

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Patent India.....lb. 10¢ to 10¢  
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Braided, Drab Cotton.....lb. 39¢ to 34¢  
Braided, Italian Hemp.....lb. 32¢ to 34¢  
Braided, Linen.....lb. 32¢ to 34¢  
Braided, White Cotton, Spot.....lb. 28¢ to 34¢  
Silver Lake:  
A quality, Drab, 40s.....15¢  
A quality, White, 35s.....15¢  
B quality, Drab, 35s.....15¢  
B quality, White, 30s.....15¢  
Italian Hemp, 40s.....15¢  
Linen, 57s.....15¢

### Wire, Picture—

Braided or Twisted.....70¢ to 5¢ to 5¢

### Corn Knives and Cutters— See Knives, Corn.

### Corn Planters—

See Planters, Corn.

### Crackers, Nut—

Little Walnut.....\$ gr. \$24.00  
Turner & Seymour Mfg. Co.....50¢

### Cradles—

Grain.....50¢  
Cases, 100 gro., \$4.50 to \$5.00, at fac-  
tory.

### Crayons—

White Round Crayons, gross.....50¢ to 5¢  
Cases, 100 gro., \$4.50 to \$5.00, at fac-  
tory.

D. M. Stewart Mfg. Co.  
Metal Workers' Crayons, gr. \$2.50  
Soapstone Pencils, round, flat  
or square.....gr. \$1.50  
Rolling mill Crayons.....gr. \$2.50  
Railroad Crayons (compo-  
sition) gr. \$2.00

### See also Chalk.

### Creamery Pails—See Pails.

### Crooks, Shepherds—

Fort Madison, Heavy.....\$ doz. \$7.00  
Fort Madison, Light.....\$ doz. \$6.50

### Crow Bars—See Bars, Crow.

### Cultivators—

Victor Garden.....\$ doz. \$10.00

### Cutters—

Glass.....30¢  
Smith & Hemmway Co.....30¢

### Meat—

American.....30¢  
Nos.....4 2 4 4 5 5  
Each.....\$5 \$7 \$10 \$25 \$50 \$60  
Cuneo, list:  
No.....0 1 8 10 12  
Each.....\$1.75 2.25 3.00 3.00 3.50

Enterprise.....25¢ to 25¢ to 7¢ to 4¢  
Nos.....5 10 12 22 32  
Each.....\$2 \$3 \$2.50 \$4 \$6  
Dixon's.....\$ doz. \$39.50 to \$100

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### Cultivators—

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### Cutters—

Glass.....30¢  
Smith & Hemmway Co.....30¢

Hale's, \$ doz.....60¢ to 10¢ to 70¢  
Nos.....11 13 15  
Home No. 1, \$ doz.....\$27.00 \$33.00 \$45.00  
Little Giant, \$ doz.....\$30.00 \$33.00 \$45.00  
Nos. 305 310 312 340 322  
\$35.00 \$48.00 \$44.00 \$73.00 \$68.00  
Sterling.....1 3 5 5 5  
Nos.....1 2 2  
Each.....\$2.00 \$2.50  
Miles' Challenge, \$ doz.....45¢ to 15¢ to 10¢  
Nos.....1 2 3  
New Triumph No. 605, \$ doz. \$24.00  
Woodruff's, \$ doz.....40¢  
Nos.....100 150  
Chadborn's Smoked Beef Cutter, \$ doz.  
Enterprise Beef Shavers.....35¢ to 30¢

### Slaw and Kraut—

Henry Dils on & Son:  
Slaw, C. rn Grater, &c.....40¢  
Kraut Cutters 24 x 7, 96 x 8, 30 x 9, 55¢  
Kraut Cutters 36 x 12, 40 x 12.....40¢  
Tucker & Dorsey Mfg. Co.:  
Kraut Cutters.....40¢  
Slaw Cutters, 1 Knife, \$ gr.....\$15 to \$20  
Slaw Cutters, 2 Knife, \$ gr.....\$22 to \$36

### Tobacco—

All Iron, Cheap.....\$ doz. \$4.50 to \$1.50  
Enterprise.....25¢ to 30¢  
National, \$ doz. \$31.00.....40¢  
Sargent's, \$ doz. \$24.00.....60¢ to 60¢ to 10¢

### Washer—

Appleton's, \$ doz. \$16.00.....60¢ to 10¢ to 10¢ to 10¢  
Bonney's.....\$ doz. \$4.75

### Diggers, Post Hole, &c.—

Dalby Post Hole Auger.....per doz. 40¢  
Iwan's Improved Post Hole Auger.....40¢  
Iwan's Perfection Post Hole Digger.....40¢

Kohler's Universal.....\$ doz. \$9.00  
K. hler's Little Giant.....\$ doz. \$15.00  
Kohler's Hercules.....\$ doz. \$12.00  
Kohler's Invincible.....\$ doz. \$10.00  
Kohler's Rival.....\$ doz. \$9.00  
Kohler's Pioneer.....\$ doz. \$9.00  
Never-Break Post Hole Diggers, \$ doz.  
\$24.00.....40¢  
Samson, \$ doz. \$34.00.....25¢

### Dividers—See Compasses.

### Dog Collars—See Collars, Dog.

### Door Checks—

### See Checks, Door.

### Door Springs—

### See Springs, Door.

### Drawers, Money—

Tucker's Pat. Alarm Tull No. 1, \$ doz.  
\$18; No. 2, \$15; No. 3, \$14; No. 4, \$13.

### Drawing Knives—

### See Knives, Drawing.

### Drills and Drill Stocks—

Common Blacksmiths' Drill, each  
\$1.75 to \$2.00  
Bench Drills, Stearns.....50¢  
Brest, Millers Falls, each \$3.00, 15¢ to 10¢  
Brest, P. S. & W.....30¢ to 30¢ to 10¢  
Goodell Automatic Drills.....40¢ to 40¢ to 10¢  
Ratchet, Curtis & Curtis.....25¢  
Ratchet, Parker's.....20¢ to 25¢  
Ratchet, Weston's.....20¢ to 25¢  
Ratchet, Whitney's, P. S. & W.....40¢ to 10¢  
Whitney's Hand Drill, No. 1, \$10.00;  
Adjustable, No. 10, \$12.00.....39¢ to 5¢

### Twist Drills—

Standard List.....\$ 60¢ to 5¢  
Drill Bits or Bit Stock  
Drills—See Augers and Bits.

### Drill Chucks—See Chucks.

### Dripping Pans—

### See Pans, Dripping.

### Drivers, Screw—

Balsey's Screw Holder and Driver, \$ doz.  
2½-inch, \$6; 4-in., \$7.50 6-in., \$9.40  
Buck Bros.....30¢  
Buck Bros' Screw Driver Bits.....27¢ to 34¢  
Champion.....\$1.10 to 5¢  
Douglass Mfg. Co.....30¢ to 20¢ to 10¢  
Fray's Hol. H'dle Sets, No. 3, \$12.00 50¢  
Gay & Parsons' Ratchet.....35¢  
Goodell's Automatic.....50¢ to 10¢ to 50¢ to 10¢ to 50¢  
Mayhew's Black Handle.....50¢  
Mayhew's Monarch.....50¢ to 10¢  
New England Specialty Co.....50¢ to 10¢  
Sargent & Co.'s:  
Nos. 1, 50¢ to 50¢ and 60.50¢ to 50¢ to 10¢ to 10¢  
Nos. 20 and 40.....60¢ to 60¢ to 10¢  
Screw Driver Bits.....\$ doz. 50¢ to 70¢  
Stanley's R. & L. Co.'s:  
No. 64, Varnished Handles.....60¢ to 10¢  
No. 86.....70¢ to 10¢  
Swan's:  
Nos. 65 to 68.....50¢  
No. 40.....40¢ to 10¢  
Nos. 25, 35 and 45.....30¢ to 10¢ to 10¢

### Eave Trough, Galvanized

Territory.....Carload.....L. C. L.  
Eastern.....75¢ to 15¢ 75¢ to 10¢  
Central.....75¢ to 12½¢ 75¢ to 7½¢  
Southern.....75¢ to 10¢ 75¢ to 5¢  
S. Western.....75¢ to 2½¢ 75¢

### Terms, 2½ for cash.

### See also Conductor Pipe.

### Egg Beaters—See Beaters, Egg.

### Egg Openers—

### See Openers, Egg.

### Emery—

4 to 16 54 to 150 Fl. ur.  
Kegs.....lb. 4½¢ 5 c 5 c  
½ Kegs.....lb. 4½¢ 5½¢ 5½¢  
¼ Kegs.....lb. 5 c 5½¢ 5½¢  
10-lb cans, 10  
in case.....6 c 6½¢ 6½¢  
10-lb cans, less  
than 10.....10 c 10 c 8 c

### Enameled and Tinned Ware—See Ware, Hollow.

### Escutcheon Pins—



**Climets—**

Nail, Metal, Assorted, gro. \$1.40@1.75  
Spike, Metal, Assorted, gro. \$3.00@3.50  
Nail, Wood Handled, Assorted, gro. \$1.00@1.25  
Spike, Wood Handled, Assorted, gro. \$5.00@5.25

**Glass, American Window**

List Jan 1, 1898.

Small lots from store:  
Single, Eastern.....85%  
First Bracket.....85%  
Second and Third Brackets.....85%  
Eastern, All Other Brackets.....85%  
Double, Eastern.....85%  
First Bracket.....85%  
Second, Third, Fourth and Fifth Brackets.....85%  
All Other Brackets.....85%  
From Jobbers or Factory, with Freight Allowance, except in Eastern district:  
Carloads, Single Strength.....85%  
First Bracket.....85%  
Second and Third Brackets.....85%  
All Above.....85%  
Carloads, Double Strength.....85%  
First Five Brackets.....85%  
60 inch Bracket.....85%  
70 to 100 inch Bracket, inclusive.....85%  
All Above.....85%

**Glue—Liquid, Fish—**

List A, Bottles or Cans, with Brush.....85%  
List B, Cans (1/2 pils, pts., qts.).....85%  
List C, Cans (1/2 gal., gal.).....85%

**Glue Pots—See Pots, Glue.****Grease, Axle—**

Common Grade.....gro. \$5.00@6.00  
Allerton's Axle:  
1 lb. Tins, 1/2 gr.....\$9.00  
3 lb. Tins, 1/2 doz. \$2.00; 5 lb. \$3.00;  
10 lb. \$6.00.  
25 lb. wood pails.....\$12.00  
Dixon's Everlasting.....10-lb. pails, ea. 85%  
Dixon's Everlasting, in bxs., 1/2 doz. 1 lb. \$1.20; 2 lb. \$2.00

**Grindstone Fixtures—**

See Fixtures, Grindstone.

**Gun Powder—See Powder.****Hack Saws—See Saws.****Hacks, Axl—**

Peg Patent, Leather Top.....\$1.90@5.25  
Peg Patent, Plain Top.....\$3.50@3.75  
Sewing, Brass Ferrule.....\$1.50@1.60  
Saddlers', Brass Ferrule.....\$1.35@1.45  
Peg, Common.....\$1.25@1.35  
Brad, Common.....\$1.50@1.75

**Halters and Ties—**

Covert Mfg. Co., Web.....45%  
Covert Mfg. Co., Jute Rope.....45%  
Covert Mfg. Co., Sisal Rope.....45%  
Covert's Saddlery Works, 98 list, Web.....45%  
Covert's Saddlery Works, Leather.....45%  
Covert's Saddlery Works, Jute.....45%  
Covert's Saddlery Works, Sisal.....45%  
Covert's Saddlery Works, Manila.....45%  
Covert's Saddlery Works, Cotton.....45%

**Hammers—**

Handled Hammers—  
Heller's Machinists.....50%  
Heller's Farriers.....50%  
Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

**Heavy Hammers and Sledges—**

3 lb. and under.....1/2 doz. \$1.50  
3 to 5 lb.....1/2 doz. \$2.00  
Over 5 lb.....1/2 doz. \$2.50  
Note—Lower prices sometimes made by jobbers.  
Wilkinson's Smith's.....\$4.00@10.00 lb.

**Handcuffs and Leg Irons**

See Police Goods.

**Handles—**

Agricultural Tool Handles—  
Hoe, Rake, Fork, etc.....50%  
Shovel, etc., Wood D Handle.....50%  
Cross-Cut Saw Handles—  
Akins.....40%  
Champion.....40%  
Dixson.....40%

**Mechanics' Tool Handles—**

Auger, assorted.....gro. \$2.40@3.80  
Auger, large.....gro. \$2.85@3.00  
Brad Axl.....gro. \$1.50@1.75  
Chisel Handles—  
Apple Tanged Firmer, gro. ass'd.....\$2.25@2.50; large, \$2.75@3.00.  
Hickory Tanged Firmer, gro. ass'd.....\$1.75@2.25; large, \$2.35@2.50.  
Apple Socket Firmer, gro. ass'd.....\$1.75@2.25; large, \$2.35@2.50.  
Hickory Socket Firmer, gro. ass'd.....\$1.60@1.75; large, \$1.75@2.00.  
Hickory Socket Framing, gro. ass'd.....\$2.50@2.75; large, \$2.65@2.85.  
File, assorted.....gro. \$1.00@1.15  
Hammer, Hatchet, Axl, etc.....50%  
Hand Saw, Varnished, doz. 75@80  
Not Varnished.....55@60  
Plane Handles—  
Jack, doz. \$2.50@3.00; Jack Bolted.....55@60  
Fore, doz. \$2.50@3.00; Fore Bolted.....70@75

**Hangers—**

Barn Door, New Pattern, Round Groove, Regular:  
Inch.....3 4 5 6 8  
Doz.....\$1.10 1.45 1.80 2.10 2.75  
Barn Door, New England Pattern, Check Back, Round Groove, Regular:  
Inch.....3 4 5 6 8  
Doz.....\$1.50 2.00 2.60 3.25

Chicago Spring Butt Co.:  
Friction.....25%  
Oscillating.....25%  
Big Twin.....25%  
Chisholm & Moore Mfg. Co.:  
Baggage Car Door.....50%  
Elevator.....40%  
Railroad.....50%  
Coleman Hardware Mfg. Co.:  
Car Ball Bearing, 1/2 doz. pair \$3.50  
No. 10 Roller Bearing, doz. pr. 5.50  
No. 30 Roller Bearing, doz. pr. 4.50  
Nickel.....50%  
J. G. C.....50%  
Lane Bros.:  
Parlor, Standard.....40%  
Parlor, New Model.....40%  
Barn Door, Standard.....50%  
Covered for Wood Track.....50%  
Special.....80%  
Lawrence Bros.:  
Crown.....60%  
New York.....60%  
Sterling.....60%  
McKinney Mfg. Co.:  
No. 2, Standard, \$18.....60%  
No. 1, Special, \$13.....60%  
Stowell Mfg. and Foundry Co.:  
Badger.....60%  
Baggage Car Door.....30%  
Climate Anti-Friction.....50%  
Elevator.....50%  
Interstate.....50%  
Magic.....50%  
Matchless.....50%  
Newman.....50%  
Parlor Door.....50%  
Railroad.....50%  
Street Car Door.....50%  
Steel, Nos. 300, 400, 500.....40%  
Wild West.....50%  
Zenith for Wood Track.....50%  
Taylor & Boggis Foundry Co.:  
Kidder's.....50%  
Van Wagoner & Williams Hdw. Co.:  
American Trackless.....90%  
Wilcox Mfg. Co.:  
Bike Roller Bearing.....60%  
C. J. Roller Bearing.....60%  
Cycle Ball Bearing.....50%  
L. T. Roller Bearing.....60%  
New Era.....50%  
New Richards.....50%  
O. K. Roller Bearing.....60%  
Prindle Improved.....60%  
Richards Improved.....60%  
Richards Single Roller.....50%  
Wilcox Dwarf Roller Bearing.....40%  
Wilcox Ives.....60%  
Wilcox Tandem Roller Bearing.....60%  
Wilcox Trolley Ball Bearing.....40%  
Wilcox Trolley Roller Bearing.....50%  
Wilcox Trolley Roller Bearing.....40%  
Fire.....40%

**Harness Menders—See Menders.****Harness Snaps—See Snaps.****Hatches—**McKinney's Perfect Hasp, 1/2 doz. \$10.00  
Wrought Hasps, Staples, etc.—See Wrought Goods.**Hatchets—**Best Brands.....40%  
Cheaper Brands.....50%  
Note—Net prices often made.**Hay and Straw Knives—**

See Knives.

**Hinges—****Blind and Shutter Hinges—**Acme and Dixie Shutter:  
No.....1 1 1/2 2 3 4  
Doz. pair.....\$0.70 .85 .90 .95 .1.00  
Buffalo and Queen City Reversible Shutter:  
No.....1 1 1/2 2 3 4  
Doz. pair.....\$0.70 .85 .90 .95 .1.00  
1888 Old Pattern Blind Hinge:  
No.....1 1 1/2 2 3 4  
Doz. pair.....\$0.80 1.00 1.25 1.50 1.75  
Parker.....70%  
North's Automatic Blind Pictures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50  
Reading's Gravity.....75%  
Sargent's, Nos. 1, 3, 5.....65%  
Sargent's, Nos. 11 & 13.....70%  
Wrightville Hdw. Co.:  
Acme, Lull & Porter.....65%  
Buffalo Gravity Locking, Nos. 1, 3 and 5.....65%  
Champion Gravity Locking, No. 75, 75%  
1888 Old Pat'n, Nos. 1, 3 & 5.....75%  
Tip Pattern, Nos. 1, 3 and 5.....75%  
Double Locking, Nos. 20 and 25.....70%  
Empire, Nos. 101 and 103.....65%  
Niagara Gravity Locking, No. 1, 3 and 5.....65%  
Noiseless, Nos. 56, 60, 65 and 65.....65%  
O. S. Lull & Porter.....65%  
Pioneer, Nos. 060, 45 and 54.....65%  
Steamboat Gravity Locking, No. 10.....75%  
Stanley's Steel Gravity Blind Hinges, 1/2 doz. sets \$1.20.....80%**Gate Hinges—**Clark's or Shepard's—Doz. sets:  
No.....1 2 3  
Hinges with Latches.....\$1.90 2.50 3.25  
Hinges only.....1.30 1.65 2.00  
Latches only.....0.70 0.70 1.20  
New England:  
With Latch.....doz. \$1.75@1.80  
Without Latch.....doz. \$1.50@1.65**Reversible Self-Closing—**With Latch.....doz. \$1.65@1.75  
Without Latch.....doz. \$1.50@1.65**Western—**With Latch.....doz. \$1.60@1.65  
Without Latch.....doz. \$1.00@1.05**Spring Hinges—**Holdback, Cast Iron, gro. \$9.00@10.00  
Non-Holdback, Cast Iron.....gro. \$7.00@7.50**J. Bardley**

Bardley's Patent Checking.....10%

**Bommer Bros.**Chicago Spring Butt Co.:  
Chicago.....20%  
Garden City Engine House.....20%  
Keene's Saloon Door.....30%  
Triple End, W. Co.:  
Coleman Hdw. Co.:  
Champion Holdback.....\$ gr. \$10.00  
J. G. C.....\$ gr. \$9.50  
Nickel.....\$ gr. \$9.00**Lawson Mfg. Co.**

Matchless Pivot.....40%

**Payson Mfg. Co.**Oblique, Dbl. Acting.....50%  
Stover Mfg. Co.:  
Ideal, No. 16, Detachable, \$ gr. \$12.50  
Ideal, No. 4.....\$ gr. \$9.00  
New Idea No. 1.....\$ gr. \$9.00  
New Idea, Double Acting.....45%**Van Wagoner & Williams Hdw. Co.**Acme, Wrt. Steel.....30%  
American.....30%  
Columbia, No. 14.....\$ gr. \$9.00  
Columbia, No. 18.....\$ gr. \$9.00  
Columbia, Adjustable.....30%  
Crown Leaf, list.....\$ gr. \$12.50  
Oxford, new list.....25%**Wrought Iron Hinges—**Strap and T Hinges, etc., list Mar. 15, 1898:  
Light Strap Hinges.....66%  
Heavy Strap Hinges.....70%  
Light T Hinges.....50%  
Heavy T Hinges.....60%  
Extra Heavy T Hinges.....60%**Hinge Hasps**Stanley's Corrugated Heavy Strap.....70%  
Stanley's Cor. Ex. Heavy T.....66%**Roller Plate**Screw Hook 1/2 to 1 1/2 in. lb. 3/4@5/8  
Screw Hook 1 1/2 to 2 in. lb. 3/4@5/8  
Screw Hook 2 to 3 in. lb. 3/4@5/8**Screw Hook and Eye**1/2 in. lb. 5/8@5/4  
3/4 in. lb. 6/8@5/4  
1 in. lb. 8/8@5/4**Hoos—**Scovill and Oval Pattern.....60%  
Grub, list Feb. 23, 1899.....\$5@5.50  
D. & H. Scovill.....35%**Handled—**Aug. 1, 1899, list:  
Field and Garden.....75%  
Ladies', Boys', Toy and Onion.....70%  
Street and Mortar.....75%  
Cotton.....70%  
Planters.....70%  
Weeding.....75%  
Note—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.  
Ft. Madison Crucible Garden Hoe.....75%  
Ft. Madison Crescent Cultivator Hoe, per doz.....75%  
Ft. Madison Mattock Hoes: Junior Size.....\$ doz. \$4.50  
Ft. Madison Sprouting Hoe.....\$ doz. \$4.50  
Ft. Madison Dixie Tobacco Hoe.....75%  
Kretzinger's Cut Easy, per doz.....75%  
Warren Hoe.....60%**Hog Rings and Rings—**

See Rings and Rings.

**Hoisting Apparatus—**

See Machines, Hoisting.

**Hollow Ware—**

See Ware, Hollow.

**Holders—**Bit—  
Angular, \$ doz. \$24.00.....45%  
Nicholson File Holders and File Handles.....39%**Hooks—****Cast Iron—**Bird Cage, Reading.....50%  
Bird Cage, Sargent's List.....35%  
Clothes Line, Sargent's List.....40%  
Clothes Line, Stowell's.....70%  
Clothes Line, Reading List.....65%  
Coat and Hat, Stowell's.....70%  
Coat and Hat, Reading.....70%  
Coat and Hat, Sargent's List.....35%  
Coat and Hat, Wrightville.....65%  
Harness, Reading List.....70%**Wire—**Atlas, Coat and Hat:  
Single Cases.....45%  
10 Case Lots.....45%  
Car Harness.....50%  
Wire Coat and Hat:  
B. B.....60%  
V Brace, Chief and Car.....50%  
Gem.....50%  
Bright Wire Goods—See Wire.**Wrought Iron—**Box, or Case, Octagon Steel.....doz. \$2.10@2.30  
Cotton.....doz. \$1.05@1.15  
Picture, T. & S. Mfg. Co.....75%  
Tassel, T. & S. Mfg. Co.....50%  
Wrought Staples, Hooks, etc.—See Wrought Goods.**Miscellaneous—**

Brush, Light, doz. \$3.50; Medium, \$6.00; Heavy, \$8.50

**Grass—**

**Latches, Thumb-**  
Roggin's Latches.....doz. \$2@35  
**Lawn Mowers-**  
See Mowers, Lawn.  
**Leaders, Cattle-**  
Small.....doz. 45c; large, 55c  
Covert mfg. Co.....45@55

**Lemon Squeezers-**  
See Squeezers, Lemon.  
**Lifters, Transom-**

Dickson:  
3 x 4 ft. x 1/2".....\$100 \$11.00  
Other sizes, Iron.....70@105  
Other size, Brass and Bronze.....70@  
Excelsior.....60@60@105  
Payson's:  
Solid Grip Nos. 643 and 644, \$1.00  
Bronzed Iron.....70%

**Lines-**  
Wire Clothes, Nos. 18 19 20  
100 feet.....\$3.00 2 60 2 00  
75 feet.....\$2.55 2 00 1 70  
Ossawaun Mills:  
Crown Solid Braided Chalk.....33@35  
Mason's No. 0 to No. 5.....33@35  
Samson Cordage Works:  
Solid Braided Chalk, No. 0 to 3.....40%  
Silver Lake Braided Chalk, No. 0, \$6.00;  
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50  
No. 4, \$8.00; No. 5, \$8.50.....30%

**Locks, &c.- Cabinet-**  
Cabinet Locks.....35@55@75@  
**Door Locks, Latches, &c.-**  
[Not prices are very often made on  
these goods.]  
Reading Hardware Co.....40%  
R. & E. Mfg. Co.....42@45  
Sargent & Co.....40@40@105  
Stamper-Harry Co.....30@35  
Snow's Victor.....50@105

**Elevator-**  
Stowell's.....33@45

**Padlocks-**  
Wrought Iron, list Dec. 3, '97.....  
70@70@105  
Dog Collar, S. B. Co.....40%  
R. & E. Mfg. Co. Wrt. Steel and Brass.....40%  
S. B. & Co.....40%

**Sash, &c.-**  
Fitch's Bronze and Brass.....66@  
Fitch's Iron.....70%  
Ives' Patent.....62@10@60@105  
Oefner's Automatic.....50%  
Payson's Perfect.....70%  
Payson's Signal (new list).....75%  
Reading.....60@10@105

## Machines-

**Boring-**  
Without Augers.  
Upright. Angular.  
Improved No. 3.....\$4.25 No. 1 \$5.00  
Improved No. 4.....3.75 No. 2 3.38  
Improved No. 5.....2.75  
Jennings.....2.50 3.00  
Millers' Falls.....5.75  
Smith's, Rice's Pat. 2.50 2.75  
Swan's, No. 500.....5.10 No. 200 6.45

**Hoisting-**  
Moore's Anti-Friction Differential Pulley Block.....30%  
Moore's Hand Hoist, with Lock Brake.....20%

**Washing-**  
Wayne American, \$27.00  
Western Star, No. 2, \$28.00  
Western Star, No. 3, \$30.00  
St. Louis, No. 41, \$30.00

**Mallets-**  
Hickory.....45@50@55  
Lignumvite.....45@50@55  
Tinnars', Hickory and Applewood,  
doz.....60@55c  
Fiber Head Stearns.....80@105

**Mats- Door-**  
Elastic Steel (W. G. Co.).....10%

**Mattocks-**  
List Feb. 23, 1899.....65@65@105

**Meat Cutters-**  
See Cutters, Meat.

**Milk Cans- See Cans, Milk.**

**Mills- Coffee-**  
Box and Side, list Jan. 1, '88.....  
60@55@60@105  
Net prices are often made on some  
goods which are lower than above  
discounts.

Enterprise Mfg. Co.....25@30%  
National, list Jan. 1, '94.....30%  
Parker's Columbia and Victor.....60@105  
Parker's Upright.....30@105  
Swift, Lane Bros.....30%

**Mincing Knives-**  
See Knives, Mincing.

**Molasses Gates-**  
See Gates, Molasses.

**Money Drawers-**  
See Drawers, Money.

**Mowers, Lawn-**  
Net prices are generally quoted.  
Cheap.....all sizes, \$2.00  
Good.....all sizes, \$2.50@2.75  
10 12 14 16-inch  
High Grade 4.25 4.50 4.75 5.00  
Pennsylvania and Continental 60@105  
Quaker City.....70@55  
Great American.....70@55

## Philadelphia:

Stray's M. S. C. K. T.....70@105  
Style A, all Steel.....60@105  
Style F, Low Wheel.....60@105  
Style E, High Wheel.....70@105  
Drexel and Gold Coin, low list.....50%

## Nails-

Cut and Wire. See Trade Report.  
Wire Nail: and Brads, Papered.  
List July 20, 1899.....80@105@105  
Hungarian, Finishing, Upholster-  
ers', &c. See Tacks.

## Horse-

Nos. 6 7 8 9 10  
A. C.....25@25@25@25@25  
Capewell.....19@18@17@16@15@14  
C. B. K.....25@25@25@25@25  
Chaplain.....28@28@28@28@28  
Maud S.....25@25@25@25@25  
Nenonset.....23@21@20@19@18  
Putnam.....23@21@20@19@18  
Standard.....23@21@20@19@18  
Star.....23@21@20@19@18  
Vulcan.....23@21@20@19@18

## Picture

Brass Head, 1 1/2 2 2 1/2 3 3 1/2 in.  
For. Head.....1.10 1.10 1.10 ..gro.

## Nippers, See Pliers and Nippers.

## Nut Crackers-

See Crackers, Nut.

## Nuts-

List Feb. 1, '99.  
Cold Punched, Off  
Mfrs. or U. S. Standard, list.

Hexagon, plain.....4.40@4.50  
Square, plain.....4.30@4.40  
Square, C. T. & R.....4.10@4.30  
Hexagon, C. T. & R.....4.70@4.80

Hot Pressed:  
Mfrs., U. S. or Nar. Gauge Stan'd.  
Square.....5.20@5.30  
Hexagon.....5.50@5.60  
NOTE.—Tapped Nuts are now 2-10c  
higher than above.

## Oakum-

Best or Government.....lb. 6 1/4c  
Navy.....lb. 5 c  
U. S. Navy.....lb. 5 1/4c  
Plumbers' Spun Navy.....3 c  
In carload lots 1/4 lb. off f.o.b. New  
York.

**Oil, Axle-**  
Snow Flake:  
1 pt. cans, per doz.....\$3.00  
2 qt. cans, per doz.....\$4.80  
1 gal. cans, per doz.....\$15.00  
5 gal. cans, per doz.....\$6.00

## Oil Tanks- See Tanks, Oil.

## Oilers-

Brass and Copper.....10@10@50%  
Tin or Steel.....60@105@70c  
Zinc.....60@105@70c  
Malleable, Hammers' Improved, No. 1,  
\$3.60; No. 2, \$4; No. 3, \$4.40 per doz. 20%  
Malleable, Hammers' Old Pattern,  
same list.....50@105  
Wilmot & Hobbs Mfg. Co.....70@70@105

## Openers-

**Can-**  
French.....doz. 35c  
Iron Handle.....doz. 25@27c  
Sprague, Iron Hdl., per doz. 55@40c  
Sardine Scissors.....doz. \$1.75@3.00  
Tip Top.....per doz. \$0.75  
National, \$ gro.....\$1.75@2.00  
Stowell's.....per doz. 40@45c

**Egg-**  
Nickel Plate.....per doz., \$2.00  
Silver Plate.....per doz., \$4.00

## Packing-

**Rubber-**  
Standard, fair quality.....70@105@75%  
Inferior quality.....75@105@80%  
Extra.....60@55@105@  
Jenkins' Standard, \$ 80c.....25@25@55

**Miscellaneous-**  
American Packing.....9@10c lb.  
Cotton Packing.....13@14c lb.  
Italian Packing.....10 1/2@11 1/2c lb.  
Jute.....5@5 1/2c lb.  
Russia Packing.....12@15c lb.

## Pails-

**Creamery-**  
S. S. & Co., with gauges, No. 1 \$6.50;  
No. 2, \$6.75 per doz.

**Galvanized-**  
Price per gro.

Inch.....10 15 16  
Water, Regular.....18 00 21 00 24 00  
Water, Heavy.....22 00 25 00 28 00  
Fire, Rd. Bottom.....31 00 35 00 35 00  
Well.....27 00 29 00 31 00

## Pans-

**Dripping-**  
Standard List.....60@60@55

**Fry-**  
Standard List.....75@105@50%

## Roasting and Baking-

Rezal, S. S. & Co., \$ doz. Nos. 5, \$4.50;  
10, \$5.00; 20, \$5.50; 30, \$6.00  
Simplex, \$ gro. No. 40, \$30.00; 50,  
\$34.50; 60, \$39.00; 140, \$33.00; 150,  
\$37.50; 160, \$43.00.

## Paper-

**Building Paper-**  
Per roll  
Rosin Sized Sheathing: 500 sq. ft.  
Light wt., 20 sq. ft. to lb. \$0.40@0.45  
Medium wt., 12 sq. ft. to lb. \$0.60@0.65

Heavy wt., extra quality, \$0.95@1.05  
Medium Grades Water Proof  
Sheathing.....\$0.80@1.25  
Deafening Felt, 9, 6 and 1 1/2 sq. ft.  
to lb., ton.....\$43.00@45.00  
York Haven Waterproof Sheathing.....\$1.35@1.75

## Tarred Paper.

1 ply (roll 90 sq ft.), ton, \$32.00@37.00  
2 ply, roll 100 sq. ft.....75c  
5 ply, roll 100 sq. ft.....\$1.00

## Sand and Emery-

List Dec. 23, 1899.....50@105@105@105  
see Trade Report.

## Parers-

**Apple-**  
Advance.....\$ doz. \$4.50  
Baldwin.....\$ doz. \$5.00  
Bonanza.....each \$7.50  
Dandy.....each \$16.00  
Eureka, 1898.....\$ doz. \$12.00  
Family Bay State.....\$ doz. \$4.00  
Hudson's 11 tie Star.....\$ doz. \$4.00  
Hudson's Ro-king Table.....\$ doz. \$5.50  
Improved Bay State \$ doz. \$3.00  
New Lightning.....\$ doz. \$5.50  
Reading 73.....\$ doz. \$4.00  
Reading 78.....\$ doz. \$7.00  
Turn Table 78.....\$ doz. \$5.50  
White Mountain.....\$ doz. \$4.00

**Potato-**  
Saratoga.....\$ doz. \$5.50  
White Mountain.....\$ doz. \$4.50

## Paris Green-

Arsenic, kegs or casks.....lb. 12 1/2@13 c  
Kegs, 100 to 175 lb.....lb. 13 @13 1/2c  
Kits, 14, 28, 56 lb.....lb. 14 @14 1/2c  
Paper boxes, 2 to 5 lb.....lb. 14 @14 1/2c  
Paper boxes, 1 lb.....lb. 14 1/2@15 c  
Paper boxes, 1/2 lb.....lb. 15 1/2@16 c  
Paper boxes, 1/4 lb.....lb. 16 1/2@17 c

## Picks and Mattocks-

List Feb. 23, 1899.....65@65@105

## Pinking Irons-

See Irons, Pinking.

## Pins-

## Escutcheon-

Brass.....60@60@55  
Iron, list Nov. 11, '85.....60@60@55

## Pipe, Cast Iron Soil-

Factory Shipments.  
Standard, 2-6 in.....65@105  
Extra Heavy, 2-6 in.....70%  
Fittings.....75%

## Pipe, Merchant, Boiler

**Tubes, &c.-**  
Merchant Pipe.

Black Galva-  
nized.  
1/4, 1/2, 3/4 inch.....47 1/2% 51 1/2%  
1 inch.....48 % 52 %  
1 1/4 to 4 inch.....49 % 53 %  
4 1/2 to 12 inch.....49 % 53 %

## Boiler Tubes.

Iron. Steel.  
1 to 1 1/2 inch.....21% 25%  
1 1/2 to 2 1/4 inch.....26 1/4% 29 1/4%  
2 1/4 to 3 inch.....47 1/2% 50%  
3 and 9 inch to 13 inch, 37% 40%

## Casing.

S. & S. I. Jt.  
2 inch.....23 1/4% 26%  
2 1/4 to 2 3/4 inch.....36 1/2% 37 1/2%  
3 to 4 1/2 inch, and 5 1/2 to  
12 1/2 inch.....45 1/2% 48%  
4 1/2 to 7 1/2 inch.....50% 53%  
7 1/2 inch.....47 1/2% 49%

NOTE.—The old list is still used by some  
jobbers, and prices are irregular.

## Planes and Plane Irons-

## Wood Planes-

Molding.....40@42 1/2@40@55  
Bench, First quality.....45@105@45@105  
Bench, Second quality.....45@105@45@105

Bailey's (Stanley R. & L. Co.)  
50@105@50@105@105  
Gage Self Setting.....35%

## Iron Planes-

Bailey's (Stanley R. & L. Co.)  
50@105@50@105@105  
Chaplin's Iron Planes.....50@105  
Miscellaneous Planes (Stanley R. & L.  
Co.).....25@105@25@105@105  
Sargent's.....50@105@50%

## Plane Irons-

Wood Bench Plane Irons.. \$5@35@55  
Buck Bros.....\$5.00@5.25 to 2  
Stanley R. & L. Co., 50@105@50@105@105  
L. & J. White.....20@55@25%

## Planters, Corn, Hand.

Kohler's Eclipse.....\$ doz. \$9.00

## Plates-

Filloc.....lb. 3 1/4@3 1/2c  
Self-Sealing Pie Plates (S. S. & Co.),  
\$ doz. \$2.00.....50%

## Pliers and Nippers-

Button Pliers.....65@105@70@105

## Gas Burner, per doz., 5 in., \$1.15@

\$1.20; 6 in., \$1.35@1.45.

## Gas Pipe, 7 8 10 12-in.

\$1.75 \$2.00 \$2.75 \$3.75

## Aeme Nippers.....40@105@55

Bernard's:  
Parallel Pliers, &c.....33 1/2%

Paragon Pliers.....50

Lodi Pliers.....50%

Elm City Fence Pliers.....33 1/2%

Heller's Parriers' Nippers, Pincers, &c.  
Morrill's Parallel, &c. and Fools 50@50@55

P. S. & W. Cast Steel.....30@105@40%

P. S. & W. Tinnars' Cutting Nippers.....40@49@55

Utica Drop Forge & Tool Co.:  
Pliers and Nippers, all kinds.....40%

## Plumbs and Levels-

Plumbs and Levels.....70@105@105@75@105@105

Daston's.....70%

Pocket Levels.....70@105@105@75@105

Stanley R. & L. Co., 70@105@105@75@105@105

Stanley's Duplex.....25@105@25@105@105

Woods' Extension.....33 1/2%

## Poachers, Egg-

Buffalo Steam Egg Poachers, \$ doz.  
No. 1, \$7.20; No. 2, \$11.00 No. 3,  
\$11.00; No. 4, \$14.50.....50%

## Points, Glaziers'-

Bulk and 1 lb. papers.....lb. 11 1/4@12 c

1/2-lb. papers.....lb. 12 @12 1/2c

1/4-lb. papers.....lb. 12 1/2@15 c

## Pokes, Animal-

Ft. Madison Pawkers.....\$ doz. \$3.25

Ft. Madison, Western.....\$ doz. \$3.75

## Police Goods-

Manufacturers' Lists.....25@25@55

Towers.....25%

## Polish-Metal-

Prestoline Liquid, No. 1 (1/4 pt.), \$ doz.  
\$3.00; No. 2 (1 qt.), \$9.75.....40%

Prestoline Paste.....33 1/2@40%

U. S. Metal Polish Paste, 3 oz. boxes, \$  
doz. 50%; \$ gr. \$4.50; 1/2 lb. boxes, \$  
doz. \$1.25; 1 lb. boxes, \$2.25.

U. S. Liquid, 3 oz. cans, \$ doz. \$1.25;  
\$ gr. \$12.00.

Barkeepers' Friend Metal Polish, \$ doz.  
\$1.75; \$ gr. \$18.00.

Wynn's White Silk, 1/4 pt. cans, \$ doz. \$1.50

## Stove-

Black Eagle Benzine Paste, 5 lb. cans,  
\$ doz. \$10

Black Eagle, Liquid, 1/4 pt. cans.....\$ doz. 75c

Black Jack Paste, 1/4 lb. cans, \$ gro. \$9.00

Ladi's Black Beauty, \$ gr. \$10.00.....50%

Joseph Dixon's, \$ gr. \$5.75.....10%

Dixon's Plumbago.....\$ gr. \$1.84

Fireside.....\$ gr. \$2.50

Gem, \$ gr. \$4.50.....10%

Japanese.....\$ gr. \$3.50

Jet Black.....\$ gr. \$3.50

Peerless Iron Enamel, 1/4 pt. cans.....\$ doz. \$1.50

Wynn's Black Silk, 5 lb. pail.....\$ doz. \$12

Wynn's Black Silk, 1/4 lb. box, \$ doz. \$1.00

Wynn's Black Silk, 5 oz. box, \$ doz. \$0.75

Wynn's Black Silk, 8 oz. liq., \$ doz. \$1.00

## Poppers, Corn-

Round or Square:

1 qt.....gro. \$7.00@8.00

1 1/2 qt.....gro. 9.50@10.50

2 qt.....gro. 10.50@11.50

Quincy Corn Popper, 1 qt., \$ gr.  
\$16.50; 2 qt., \$19.00.

## Post Hole and Tree Au-

gers and Diggers-

See also Diggers, Post Hole, &c.

## Potato Parers-

See Parers, Potato.

## Pots-

## Glue-

Enameled.....10



|              |      |      |           |
|--------------|------|------|-----------|
| Copper ..... | 1.10 | 1.30 | 1.50 doz. |
|--------------|------|------|-----------|

|                                |        |
|--------------------------------|--------|
| Griffin's complete.....        | 40&10% |
| Griffin's Hack Saw Blades..... | 40&10% |
| Star Hack Saws and Blades....  | 15&10% |

|                                   |     |
|-----------------------------------|-----|
| Atkin's Criterion.....            | 40% |
| Atkin's Adjustable.....           | 40% |
| Bemis & Call Co.'s Cross Cut..... | 30% |

*Note.*—The above are the regular Association prices to small retailers, but are often shaded by jobbers \$0.50 @ 1.00.

after shaded by jobs at \$0.50-1.00

**Shovels and Tongs—**

Brass Head.....60¢ to 60¢ 10¢  
 Iron Head.....60¢ to 60¢ 10¢

**Sieves and Sifters—**

Hunter's Imitation, gro. \$11.00 to \$12.00  
 Buffalo Metallic Blue, S. S. & Co., # gr. 14 to 18.....\$13.90  
 # gr. 18 to 20.....\$15.00  
 # gr. 20 to 24.....\$16.00  
 Electric Light.....\$ gr. \$10.00  
 Hunter's Genuine.....\$ gr. \$12.00  
 Shaker (Barter's Pat.) Flour Sifters.....\$ doz., \$2.00.

**Sieves, Wooden Rim—**

Nested, 10, 11 and 12 Inch.  
 Mesh 20, Nested, doz.....\$0.75 to \$0.80  
 Mesh 20, Nested, doz.....\$0.85 to \$0.90  
 Mesh 24, Nested, doz.....\$1.00 to \$1.05

**Sinks—**

Cast Iron—  
 Low list.....50¢ to 10¢ 60¢  
 Note—The low list is now generally used, but some jobbers use high list.

**Wrought Steel—**

Columbus Galv'd and Enamelled.....60¢ to 55¢  
 Columbus, Painted.....40¢  
 L. & G.....45¢

**Skins, Wagon—**

Cast Iron.....70¢ to 70¢ 10¢  
 Malleable Iron.....40¢ to 50¢  
 Steel.....35¢ to 35¢ 5¢  
 L. I. & B. Co. Steel.....35¢

**Slates—**

"D" Slates.....50¢ to 10¢ 50¢ to 10¢ 10¢  
 Unexcelled Noiseless Slates.....60¢ to 10¢ 60¢ to 10¢ 5¢  
 Wire Bound.....60¢ to 10¢ 60¢ to 10¢ 5¢  
 Double Slates, add \$1 case, net.

**Slaw Cutters—See Cutters.****Slicers, Vegetable—**

Sterling \$2.00.....89¢

**Snaps, Harness—**

German.....40¢ to 40¢ 10¢  
 Covert Mfg. Co.:  
 Derby.....35¢ to 35¢  
 High Grade.....45¢ to 45¢  
 Jockey.....40¢ to 40¢  
 Trojan.....45¢ to 45¢

**Covert's Saddlery Works:**

Banner.....60¢ to 10¢  
 Crown.....60¢ to 10¢  
 Triumph.....60¢ to 10¢  
 W. & E. T. Fitch Co.:  
 Bristol.....40¢ to 10¢  
 Empire.....50¢ to 50¢  
 German.....40¢  
 National.....50¢ to 50¢  
 Perfect.....45¢  
 Clipper.....50¢ to 50¢  
 Champion.....40¢  
 Security.....40¢  
 Victor.....60¢ to 50¢  
 One in Common by:  
 Solid Steel.....65¢ to 65¢ 10¢  
 Solid Swivel.....65¢ to 65¢ 10¢  
 Sargent's Patent Guarded.....60¢ to 60¢ 10¢

**Snaths—**

Scythe.....45¢ to 45¢

**Snips, Tinnners'—See Shears.****Soldering Irons—**

See Irons, Soldering.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Silver Plated—  
 Flat Ware.....50¢ to 10¢ 50¢ to 10¢  
 Wm. Rogers Mfg. Co.....50¢ to 10¢

**Miscellaneous—**

German Silver.....60¢ to 10¢  
 Wm. Rogers Mfg. Co.:  
 125 German Silver.....60¢  
 Rogers' Silver Metal.....50¢ to 10¢

**Springs—**

Door—  
 Gem (Coll.).....20¢  
 Star (Coll.).....30¢  
 Torrey's Rod, 39 in. # doz. \$1.10 to \$1.25  
 Warner's No. 1, # doz. \$1.50; No. 2, \$3.40  
 Victor (Coll.).....60¢ to 10¢ 60¢ to 10¢ 5¢

**Carriage, Wagon, &c.**

Factory Shipments.  
 1 1/2 in. and wider...Blk. Hf. Brit. Brit.  
 Tested and Temp 4 1/4 4 1/2 4 3/4 lb  
 Oil Tested and  
 Tempered.....lb  
 Cliff's Bolster Springs.....35¢  
 Cliff's Seat Springs.....\$ pair 55¢

**Sprinklers, Lawn—**

Enterprise.....25¢ to 30¢  
 Philadelphia No. 1, # doz. \$12; No. 2, \$15; No. 3, \$24.....30¢

**Squares—**

Nickel plated.....(List Jan. 5, 1900)  
 Steel and Iron.....70¢  
 Rosewood Hdl. Try Square and T-Bevels.....60¢ to 10¢ 60¢ to 10¢  
 Iron Hdl. Try Squares and T-Bevels.....40¢ to 10¢ 40¢ to 10¢

**Diston's Try Sq. and T-Bevels.....60¢ to 10¢**

Winterbottom's Try and Miter.....50¢ to 10¢

**Squeezers—**

Lemon—  
 Wood, Common, gro., No. 0, \$5.25  
 \$5.50; No. 1, \$6.25 to \$6.50.  
 Wood, Porcelain Lined:  
 Cheap.....doz. \$2.00 to \$2.75  
 Good Grade.....doz. \$3.00 to \$3.50

Tinned Iron.....doz. \$0.75 to \$1.25  
 Iron, Porcelain Lined doz. \$2.90 to \$3.25  
 Jennings' Star.....# doz. \$1.85 to \$1.90  
 King.....# doz. \$2.00

**Staples—**

Barbed Blind.....lb. 9¢ to 10¢  
 Electricians', Association list, 7¢ to 10¢  
 Fence Staples, same price as Barbed Wire. See Trade Report.  
 Poultry Netting.....50¢ to 10¢  
 Grand Crossing Tack Co.'s list.....75¢ to 10¢

**Steels, Butchers'—**

Dick's.....40¢  
 Foster Bros.....30¢  
 C. & A. Hoffmann's.....40¢  
 Nichols Bros.....50¢

**Steelyards.....50¢ to 50¢ 10¢**

Blacksmiths.....40¢ to 40¢ 10¢  
 Gardner.....50¢  
 Green River.....25¢  
 Lightning Screw Plate.....25¢  
 Little Giant.....25¢  
 Beece's New Screw Plate.....25¢ to 30¢  
 Curtis R. ersible Ratchet Die Stock.....25¢

**Stocks and Dies—**

Pike Mfg. Co., list '95-'96.....\$3.45  
 Cleveland Stone Co., list Nov. '99.....\$3.45

**Stone—**

Scythe Stones—  
 Pike Mfg. Co., list '95-'96.....\$3.45  
 Cleveland Stone Co., list Nov. '99.....\$3.45

**Oil Stones, &c.**

Pike Mfg. Co.:  
 Hindostan No. 1, # D...\$5  
 Sand Stone.....5¢  
 Turkey Oil Stone, Extra.....\$3.45  
 \$ to 3 in.....\$3.45 to 10¢  
 Turkey Slips.....\$1.50  
 Lily White Washita.....60¢  
 Rosy Red Washita.....60¢  
 Washita Stone, Extra.....60¢  
 Washita Stone, No. 1.....40¢  
 Washita Stone, No. 2.....40¢  
 Lily White Slips.....90¢  
 Rosy Red Slips.....90¢  
 Washita Slips, Extra.....80¢  
 Washita Slips, No. 1.....70¢  
 Arkansas Stone, No. 1, 3 to 5 in.....\$2.50  
 Arkansas Stone, No. 1, 5 to 10 in.....\$3.50  
 India Oil Stones.....25¢ to 30¢  
 Tanite Mills:  
 Emery Oil, # doz. \$5.00.....50¢ to 80¢

**Stones—**

Enterprise.....25¢ to 80¢

**Stops, Bench—**

Millers Falls.....15¢ to 10¢  
 Morrill's.....# doz. No. 1, \$10.00; No. 2, \$11.00, 40¢ to 30¢

**Stops, Window—**

Ives' Patent.....25¢ to 25¢  
 Taplin's.....40¢  
 Wilcox, Steel, per doz., \$8.00.....50¢

**Stove Boards—**

See Boards, Stove.

**Stove Polish—See Polish, Stove.****Straps, Box—**

Cary's Universal, case lots.....20¢ to 10¢

**Stretchers, Carpet—**

Cast Iron, Steel Points.....doz. 55¢ to 65¢  
 Cast Steel, Polished.....doz. \$2.25  
 Socket.....doz. \$1.75

**Stuffers, Sausage—**

Miles' Challenge, # doz. \$20.....50¢ to 50¢ 5¢  
 Enterprise Mfg. Co.....25¢ to 25¢ 7¢  
 National Specialty Mfg. Co., list Jan. 1, '97.....30¢

**Tacks Brads, &c.—**

See Trade Report,  
 List Jan. 15, '99.  
 Carpet Tacks, American.....90¢ to 10¢  
 American Cut Tacks.....90¢ to 30¢  
 Swedes Iron Tacks.....90¢ to 30¢  
 Swedes Upholsterers' Tacks.....90¢ to 30¢  
 Gimp Tacks.....90¢ to 10¢  
 Lace Tacks.....90¢ to 10¢  
 Trimmers' Tacks.....90¢ to 10¢  
 Looking Glass Tacks.....70¢ to 10¢  
 Bill Posters' and Railroad Tack.....90¢ to 30¢  
 Hungarian Nails.....80¢ to 25¢  
 Common and Patent Brads, 70¢ to 10¢  
 Trunk and Clout Nails.....60¢ to 50¢

**Miscellaneous—**

Double Point Tacks.....90¢ to 5¢ tens  
 Steel Wire Brads, R. & E. Mfg. Co.'s list.....50¢ to 10¢ 60¢  
 See also Nails, Wire.

**Tanks, Oil—**

Emerald, S. S. & Co.....30-gal. \$3.20  
 Emerald, S. S. & Co.....50-gal., \$4.00  
 Queen City S. S. & Co.....60-gal.....\$3.50  
 Queen City S. S. & Co., 60-gal.....\$4.25

**Tapes, Measuring—**

American Asses' Skin.....40¢ to 10¢ 50¢  
 Patent Leather.....25¢ to 30¢ 5¢  
 Steel.....40¢ to 10¢ 5¢  
 Chesterman's.....55¢ to 25¢ 5¢

Eddy's Steel.....40¢ to 40¢ 5¢  
 Eddy's Metallic.....33¢ to 33¢ 5¢  
 Keuffel & Esser Co., Steel and Metallic Lower list, 1899.....35¢  
 Lufkin's Steel.....33¢ to 35¢  
 Lufkin's Metallic.....30¢ to 35¢

**Thermometers—**

Tin Case.....80¢ to 80¢ 10¢

**Ties, Bale—Steel.**

Standard Wire.....50¢ to 10¢ 5¢

**Ties, Wall—**

Cleveland, Steel.....# 1000, \$10.00

**Tinners' Shears, &c.—**

See Shears, Tinnners', &c.

**Tinware—**

Stamped, Japanned and Piced, sold very generally at net prices.

**Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.****Tobacco Cutters—**

See Cutters, Tobacco.

**Tools—**

Coopers'—  
 L. & I. J. White.....20¢ to 20¢ 5¢

**Saw—**

Atkins' new list.....40¢  
 Simonds' Improved.....35¢ to 35¢  
 Simonds' Crescent.....25¢

**Ship—**

L. & I. J. White.....20¢

**Transom Lifters—**

See Lifters, Transom.

**Traps—Game—**

Oneida Pattern.....70¢ to 10¢ 75¢ to 10¢  
 Newboise.....45¢ to 50¢  
 Hawley & Norton.....65¢ to 50¢ 70¢  
 Victor (Oneida Pattern).....75¢ to 75¢ 10¢  
 Star (Blake Pattern).....65¢ to 10¢ 70¢ to 50¢

**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes 9¢ to 10¢  
 Mouse, Round or Square Wire.....doz. \$0.85 to 1.00  
 Marty French Rat and Mouse Traps (Genuine):  
 No. 1, Rat, # doz. \$12.00; case of 24, \$10.50  
 No. 3, Rat, # doz. \$5.50; case of 50, \$5.00  
 No. 3 1/2, Rat, # doz. \$1.50; case of 75, \$2.75  
 No. 4, Mouse, # doz. \$3.50; case of 75, \$2.75  
 No. 5, Mouse, # doz. \$2.75; case of 150, \$3.35

Schuyler's Rat Killer, No. 1, # gr. \$30.00; No. 2, # gr. \$30.00; Mouse, No. 3, \$18.00.  
 Out o' Sight, Mouse, No. 1, # doz. 60¢; Rat, No. 2, \$1.25; Mole, \$6.00; Gopher, \$1.50; Stop Thief, No. 1, \$1.25; No. 2, \$1.50.

**Flv—**

Balloon, Globe or Acme.....doz. \$1.15 to 1.25; gro. \$12.00 to 14.00  
 Harper, Champion or Paragon.....doz. \$1.25 to 1.40; gro. \$13.50 to 15.00

**Trimmers, Spoke—**

Bonney's No. 1 and 2.....40¢  
 Stearns.....35¢

**Trowels—**

Diston Brick and Pointing.....80¢  
 Diston Plastering.....25¢  
 Diston "Standard Brand" and Garden Trowels.....40¢  
 Never-Break steel Garden Trowels.....gro. \$7.00  
 Peace's Plastering.....30¢  
 Rose Brick and Plastering.....25¢ to 25¢  
 Woodrough & McParlin, Plastering.....25¢ to 10¢

**Trucks, Warehouse, &c.—**

B. & L. Block Co.'s list.....40¢  
 Daisy Stove Trucks, Improved pattern.....\$18.00  
 Model Stove Trucks.....# doz. \$18.50

**Tubs, Wash—**

Galvanized, per doz. \$5.00 5 50 6.00  
 Galvanized S. S. & Co., with Wringer Attachment, # doz. No. 10, \$7.25  
 No. 20, \$7.75; No. 30.....\$8.25

**Twine—**

Carload lots f.o.b. New York, Philadelphia or Boston.  
 White Sisal, 500 ft. to lb. per lb. 11 c  
 Standard, 500 ft. to lb. per lb. 11 c  
 Manila, 600 ft. to lb. per lb. 14 c  
 Pure Manila, 650 ft. to lb. per lb. 15 1/4 c  
 Less than carloads add 1/4 c per lb.

**Miscellaneous—**

Flax Twine—  
 No. 9, 1/4 and 1/2-lb. Balls.....22c 26c  
 No. 12, 1/4 and 1/2-lb. Balls.....19c 22c  
 No. 13, 1/4 and 1/2-lb. Balls.....16c 19c  
 No. 24, 1/4 and 1/2-lb. Balls.....12c 15c  
 No. 36, 1/4 and 1/2-lb. Balls.....15c 18c  
 Chalk Line, Cotton, 1/2-lb. Balls.....15¢ to 20¢  
 Cotton Mops, 6, 9, 12 and 15 lb. to doz.....7¢ to 8¢  
 Cotton Wrapping, 5 Balls to lb.....9¢ to 15¢  
 American 2-Ply Hemp, 1/4 and 1/2-lb. Balls.....12¢ to 15¢  
 American 3-Ply Hemp, 1-lb. Balls.....12¢ to 15¢

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine).....10¢  
 India 3-Ply Hemp, 1-lb. Balls.....10¢  
 India 3-Ply Hemp, 1 1/2-lb. Balls.....9¢  
 2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls.....8¢ to 9¢

Mason Line, Linen, 1/2-lb. Balls.....15¢  
 No. 26, Mattress, 1/4 and 1/2-lb. Balls.....5¢  
 Wool.....70¢

**Vises—**

Solid Box.....50¢ to 50¢ 10¢  
 Bonney's Saw Vises.....40¢ to 10¢

**Parallel—**

Athol Machine Co.:  
 Simpson's Adjustable.....40¢  
 Standard.....40¢  
 Amateur.....25¢  
 Bonney's.....40¢ to 10¢  
 Fisher & Norris Double Screw.....15¢ to 10¢  
 Hollands.....40¢ to 40¢ 10¢  
 Lewis Tool Co.....20¢ to 30¢  
 Massey's Perfect.....15¢ to 30¢  
 Massey's Clincher.....30¢ to 40¢  
 Merrill's.....20¢  
 Miller's Falls.....low list 10¢  
 Parker's:  
 Victor.....30¢ to 35¢  
 Regulars.....20¢ to 25¢  
 Vulcan's.....40¢ to 45¢  
 Combination Pipe.....55¢ to 60¢  
 Prentiss.....20¢ to 25¢  
 Sargent's.....40¢  
 Simpson's Adjustable.....40¢  
 Snodder's X. L.....20¢ to 30¢  
 Stephens'.....20¢ to 30¢  
 Toles' Woodworking.....40¢  
 Van, W. & W. Hdw. Co.....40¢

**Saw Filers—**

Bonney's No. 1, \$13; No. 3, \$16 50¢ to 10¢  
 Diston's D 3 Clamp and Guide, # doz. \$30  
 Reading.....40¢ to 10¢  
 Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....30¢ to 75¢

**Miscellaneous—**

Signal & Keeler Combination Pipe Vise.....50¢  
 Parker's Combination Pipe:  
 87 Series.....60¢  
 187 Series.....60¢ to 60¢  
 No. 870.....40¢

**Wads—Price Per M.**

B. E., 11 up.....60¢  
 B. E., 9 and 10.....70¢  
 B. E., 8.....80¢  
 B. E., 7.....80¢  
 P. E., 11 up.....\$1.00  
 P. E., 9 and 10.....1.25  
 P. E., 8.....1.50  
 P. E., 7.....1.50  
 Ely's B. E., 11 and larger.....\$1.70 to 1.75  
 Ely's P. E., 12 to 20.....\$3.00 to 3.50

**Wagon Jacks—**

See Jacks, Wagon.

**Ware, Hollow—**

Aluminum—  
 S. S. & Co. Reduced List.....40¢

**Cast Iron, Hollow—**

Stove Hollow Ware:  
 Ground.....60¢ to 60¢ 7 1/4  
 Unground.....55¢ to 55¢ 10 1/4  
 White Enamelled Ware:  
 Maslin Kettles.....75¢ to 10¢ 75¢ to 10¢ 5¢  
 Boilers and Saucepans.....65¢ to 65¢ 5¢  
 Tinned Boilers and Saucepans.....65¢ to 65¢ 5¢

**See also Pots, Glue.****Enamelled—**

Agate Nickel Steel Ware, list July '99, 85¢  
 Granite Ware, list Jan. 1, '94, revised Jan. 2, '95.....40¢ to 10¢  
 Second Quality, Agate Nickel Steel.....60¢  
 Second Quality, Granite.....70¢ to 10¢ 70¢ to 10¢ 10¢

Iron Clad:  
 Peppared Ware, high list.....70¢  
 Princess Ware, special list.....55¢  
 Mottled Ware, high list.....70¢  
 Never Break Enamelled.....50¢ to 50¢ 10¢

**Tea Kettles—**

Galvanized Tea Kettles:  
 Inch.....6 7 8 9  
 Each.....60c 55c 60c 70c

**Steel Hollow Ware.**

Avery Spiders & Griddles.....65¢ to 65¢ 5¢  
 Avery Kettles.....60¢  
 Porcelain.....50¢ to 50¢ 10¢  
 Never Break Spiders and Griddles.....65¢ to 65¢ 5¢  
 Never Break Kettles.....60¢ to 60¢ 10¢  
 Solid Steel Spiders & Griddles.....65¢ to 65¢ 5¢  
 Solid Steel Kettles.....60¢  
 Solid Steel Ware, Enamelled.....50¢ to 50¢ 5¢

**Silver Plated Hollow—**

William Rogers Mfg. Co.....40¢ to 10¢

**Washboards—**

Solid Zinc.....# doz  
 Crescent, family size, bent frame.....\$3.00  
 Red Star, laundry size, stationary protector.....\$4.25  
 Double Zinc Surface:  
 Saginaw Globe, family size, stationary protector.....\$2.55  
 Wilson, family size, bent frame.....\$2.75

**Single Zinc Surface:**

Nalad protector, family size, open back perforated.....\$3.40  
 Saginaw Globe, protector, family size, ventilated back.....\$2.55  
 Wilson, bent frame, family size, ventilated back.....\$2.50



|                                                                           |                            |
|---------------------------------------------------------------------------|----------------------------|
| <b>Washers—</b>                                                           |                            |
| <b>Leather, Axle—</b>                                                     |                            |
| Solid.....                                                                | 80¢ 10¢ 10¢ 85¢            |
| Patent.....                                                               | 85¢ 85¢ 5¢                 |
| Coil: 1/4 1 1/4 1 1/2 1 3/4 1 1/2                                         |                            |
| 1/4 1/2 1 1/2 1 3/4 1 1/2                                                 | per 100                    |
| <b>Iron or Steel</b>                                                      |                            |
| Size bolt ... 5-16 3/8 1/2 5/8 3/4                                        |                            |
| Washers.....                                                              | \$5.80 4.80 3.80 3.40 3.30 |
| In lots less than one keg add 1/4¢ per lb., 5-lb. boxes add 1/2¢ to list. |                            |
| <b>Fast Washers</b>                                                       |                            |
| Over 1/2 inch. barrel lots..... per lb., 2¢                               |                            |
| <b>Washer Cutters—</b>                                                    |                            |
| See Cutters, Washer.                                                      |                            |
| <b>Washing Machines—</b>                                                  |                            |
| See Machines, Washing.                                                    |                            |
| <b>Water Coolers—</b>                                                     |                            |
| See Coolers, Water.                                                       |                            |
| <b>Weaners—</b>                                                           |                            |
| Tyler's New Hater—No. 1 1/2 doz. \$3.45;                                  |                            |
| No. 2, \$3.70; No. 3, \$4.00; No. 4, \$4.30                               |                            |
| Tyler's Sifter—Nos. 1 and 2, 1 doz. \$1.70;                               |                            |
| No. 3, \$2.00; No. 4, \$2.30.                                             |                            |
| <b>Wedges—</b>                                                            |                            |
| Oil Finish.....lb. 1/4 @ 1/4¢                                             |                            |
| Aze Finish.....lb. 1/4 @ 1/4¢                                             |                            |

|                                                                                                                     |  |
|---------------------------------------------------------------------------------------------------------------------|--|
| <b>Weights, Sash</b>                                                                                                |  |
| Eastern prices.....\$25.00                                                                                          |  |
| Western prices.....\$20.00                                                                                          |  |
| NOTE.—There is a wide difference in prices East and West, and some Foundries are naming lower prices than the above |  |
| <b>Well Buckets, Galvanized</b>                                                                                     |  |
| See Pails, Galvanized.                                                                                              |  |
| <b>Wheels Well—</b>                                                                                                 |  |
| 8-in., \$1.75 @ 1.85; 10-in., \$2.25 @ 2.35;                                                                        |  |
| 12-in., \$2.75 @ 2.85; 14-in., \$3.25 @ 3.40                                                                        |  |
| <b>Wire and Wire Goods—</b>                                                                                         |  |
| Brt. and Ann., 6 to 9.....70¢ 10¢                                                                                   |  |
| Brt. and Ann., 10 to 12.....72 1/2 ¢ 5¢                                                                             |  |
| Brt. and Ann., 13 to 16.....75¢ 10¢ 1/2                                                                             |  |
| Brt. and Ann., 17 to 20.....75¢ 10¢ 1/2                                                                             |  |
| Cord'd and Galv., 6 to 9.....65¢ 5¢                                                                                 |  |
| Cord'd and Galv., 10 to 12.....70¢                                                                                  |  |
| Cord'd and Galv., 13 to 16.....70¢ 10¢                                                                              |  |
| Cord'd and Galv., 17 to 20.....72 1/2 ¢ 5¢                                                                          |  |
| Tinned, 6 to 9.....70¢ 10¢ 1/2                                                                                      |  |
| Tinned, 10 to 12.....70¢ 5¢                                                                                         |  |
| Tinned, 13 to 16.....65¢ 10¢                                                                                        |  |
| Tinned, 17 to 20.....65¢ 10¢                                                                                        |  |
| Annealed Wire on Spools.....                                                                                        |  |
| 60¢ 10¢ @ 60¢ 10¢ 5¢                                                                                                |  |
| Brass, list Feb. 26, '98.....80¢                                                                                    |  |
| Copper, list Feb. 26, '98.....15¢                                                                                   |  |

|                                               |  |
|-----------------------------------------------|--|
| <b>Cast Steel Wire.....50¢</b>                |  |
| <b>Stubs' Steel Wire.....\$6.00 to £, 40¢</b> |  |
| Wire Clothes Line, see Lines.                 |  |
| Wire Picture Cord, see Cord.                  |  |
| <b>Bright Wire Goods—</b>                     |  |
| Iron and Brass, list July 1, 1899.....        |  |
| 80¢ 10¢ @ 10¢ 10¢ 10¢                         |  |
| <b>Wire Cloth and Netting—</b>                |  |
| Galvanized Wire Netting.....30¢               |  |
| Painted Screen Cloth per 100 ft.....          |  |
| \$1.40 @ 1.50                                 |  |
| <b>Hardware Grade, Iron:</b>                  |  |
| 2 to 20 mesh.....sq. ft. 2 1/2 @ 3¢           |  |
| 20 to 20 mesh.....sq. ft. 3 @ 3 1/2 ¢         |  |
| Galv. Hardware Grade, 2 to 5 mesh.....        |  |
| sq. ft. 3 1/2 @ 3 1/2 ¢                       |  |
| Galv. Hardware Grade, 6 to 8 mesh.....        |  |
| sq. ft. 4 @ 4 1/2 ¢                           |  |
| <b>Wire Barb—See Trade Repor</b>              |  |
| <b>Wire, Rope—See Rope, Wire.</b>             |  |
| <b>Wrenches—</b>                              |  |
| Agricultural.....70¢ 10¢ @ 70¢ 10¢ 5¢         |  |
| Baxter's S.....60¢ 10¢                        |  |
| Coes' Genuine.....25¢ 10¢ 5¢ 5¢ 3¢            |  |
| Coes' "Mechanics".....25¢ 10¢ 5¢ 5¢ 3¢        |  |
| Acme.....60¢ 10¢                              |  |
| Alken's Pocket (Bright).....\$2.00 @ 2.30     |  |
| Alligator.....60¢ 10¢ 10¢                     |  |

|                                           |  |
|-------------------------------------------|--|
| <b>Bemis &amp; Call's:</b>                |  |
| Adjustable S.....35¢ 5¢                   |  |
| Brigg's Pattern.....40¢ 10¢               |  |
| Combination Black.....40¢ 5¢              |  |
| Combination Bright.....40¢                |  |
| Cylinder or Gas Pipe.....55¢              |  |
| Extra Heavy.....45¢                       |  |
| Merrick's Pattern.....50¢                 |  |
| No. 3 Pipe, Bright.....55¢                |  |
| Bindley Automatic.....30¢                 |  |
| Boardman's.....33 1/2 ¢                   |  |
| Bull Dog, W. & B.....40¢ 10¢ 10¢          |  |
| Donohue's Engineer.....40¢ 10¢            |  |
| Eagle.....50¢ 10¢                         |  |
| Hercules.....70¢                          |  |
| Solid Handles, P. S. & W.....40¢ 10¢      |  |
| Stevenson.....60¢ 10¢ 10¢                 |  |
| Stillson's.....55¢                        |  |
| <b>Wrought Goods—</b>                     |  |
| Staples, Hooks, &c., list March 17        |  |
| '98.....85¢ 85¢ 10¢                       |  |
| <b>Yokes, Neck—</b>                       |  |
| Covert Saddlery Works, Trimmet, 1.60 @ 5¢ |  |
| Covert Saddlery Works, Neck Yoke          |  |
| Centers.....70¢                           |  |
| <b>Yokes, Ox, and Ox Bows—</b>            |  |
| Fort Madison's Farmers & Freighters..     |  |
| list net                                  |  |
| <b>Zinc—</b>                              |  |
| Sheet.....lb. 1/4 @ 7¢                    |  |

## PAINTS, OILS AND COLORS.—Wholesale Prices.

|                                                |  |                                               |  |                                                |  |                                       |  |
|------------------------------------------------|--|-----------------------------------------------|--|------------------------------------------------|--|---------------------------------------|--|
| <b>White Lead, Zinc, &amp;c.</b>               |  | Senen, Chrome, pure..... 18 @ 29              |  | Brown, Vandyke..... 9 1/4 @ 13                 |  | Lined, City, boiled..... 07 @ 68      |  |
| Lead, Foreign white, in Oil..... 7 1/4 @ 9 1/4 |  | Lead, Red, bbls. 1/4 bbls. and kegs:          |  | Green, Chrome..... 8 @ 12                      |  | Lined, Sae and West'n, raw..... 64 @  |  |
| Lead, American White, in Oil:                  |  | Lots 500 lb. or over..... 6 @                 |  | Green, Paris..... 8 @ 12                       |  | Lined, raw Calcutta..... 70 @         |  |
| Lots of 500 lb. or over..... 6 @               |  | Lots less than 500 lb..... 6 1/4 @            |  | Sienna, Raw..... 10 @ 13                       |  | Lard, Prime..... 27 1/2 @ 29 1/2      |  |
| Lead, White, in oil, 25 lb. tin                |  | Litharge, bbls. 1/4 bbls. and kegs:           |  | Sienna, Burnt..... 10 @ 13                     |  | Lard, Extra No. 1..... 43 @ 50        |  |
| pails, add to keg price..... 1 1/4 @           |  | Lots 500 lb. or over..... 6 @                 |  | Umber, Raw..... 9 1/4 @ 12                     |  | Lard, No. 1..... 41 @ 43              |  |
| Lead, White, in oil, 12 1/2 lb. tin            |  | Lots less than 500 lb..... 6 1/4 @            |  | Umber, Burnt..... 9 1/4 @ 12                   |  | Cotton-seed, Crude..... 38 @ 34       |  |
| pails, add to keg price..... 1 @               |  | Ocher, French Washed..... 1 1/4 @ 2 1/4       |  |                                                |  | Cotton-seed, Summer Yellow,           |  |
| Lead, White, in oil, 1 to 5 lb. as-            |  | Ocher, Dutch Washed..... 4 1/2 @ 5            |  | <b>Miscellaneous.</b>                          |  | prime..... 36 1/4 @ 37                |  |
| sorted tins, add to keg price..... 1 1/4 @     |  | Ocher, American..... 10 @ 10 1/2              |  | Barytes, Foreign, 100 lb..... \$19.00 @ 21.00  |  | Cotton-seed, Summer Yellow,           |  |
| Lead, White, Dry in bbls..... 9 1/4 @ 6        |  | Orange Mineral, English..... 9 1/4 @ 12       |  | off grades..... 35 @ 35 1/4                    |  | Sperm, Crude..... 35 @                |  |
| Lead, American, Terms: On lots of 500          |  | Orange Mineral, French..... 11 1/4 @ 11 1/4   |  | Barytes, Amer. floated..... 19.00 @ 20.00      |  | Sperm, Natural Spring..... 35 @       |  |
| lbs. and over, 60 days, or \$5 for cash if     |  | Orange Mineral, German..... 9 1/4 @ 12        |  | Barytes, Crude..... 3.00 @ 10.00               |  | Sperm, Bleached Spring..... 35 @      |  |
| paid in 15 days from date of invoice.          |  | Orange Mineral, American..... 8 1/4 @ 8 1/4   |  | Chalk, in bulk..... 2 1/2 @ 2 1/2              |  | Sperm, Natural Winter..... 37 @       |  |
| Zinc, American, dry..... 5 1/4 @ 5 1/4         |  | Red, Indian, English..... 4 1/2 @ 5           |  | Chalk, in bbls..... 100 @ 85                   |  | Sperm, Bleached Winter..... 37 @      |  |
| Zinc, Paris, Red Seal, dry..... 5 1/4 @        |  | Red, Indian, American..... 3 @ 3 1/4          |  | China Clay, English, 100 lb..... 12.00 @ 17.50 |  | Whale, Crude..... 38 @                |  |
| Zinc, Paris, Green Seal, dry..... 5 1/4 @      |  | Red, Turkey, English..... 4 @ 6               |  | Cobalt, Oxide, 100 lb..... 2.25 @ 2.50         |  | Whale, Natural Winter..... 47 @       |  |
| Zinc, Antwerp Red Seal, dry..... 5 1/4 @       |  | Red, Tuscan, English..... 7 @ 10              |  | Whiting, Common, 100 lb..... 42 @ 52           |  | Whale, Bleached Winter..... 49 @      |  |
| Zinc, Antwerp Green Seal, dry..... 5 @         |  | Red, Venetian, Amer., 100 lb..... 80 @ 110    |  | Whiting, Gliders..... 54 @ 64                  |  | Menhaden, Crude, Sound..... 43 @ 36   |  |
| Zinc, V. M. French, in Poppy                   |  | Red, Venetian, English 100 lb..... 80 @ 110   |  | Whiting, extra Gliders..... 55 @ 65            |  | Menhaden, Light Strained..... 29 @ 30 |  |
| Oil, Green Seal..... 11 1/4 @                  |  | Sienna, Italian, Burnt and                    |  |                                                |  | Menhaden, Bleached Winter..... 35 @   |  |
| lots of 1 ton and over..... 11 1/4 @           |  | Powdered..... 3 1/4 @ 9 1/4                   |  |                                                |  | Menhaden, Extra Bleached..... 37 @    |  |
| lots less than 1 ton..... 11 1/4 @             |  | Sienna, Ital., Raw, Powd..... 3 1/4 @ 7 1/4   |  |                                                |  | Tallow, prime..... 53 @ 54            |  |
| Zinc, V. M. French, in Poppy                   |  | Sienna, American, Raw..... 1 1/2 @ 2          |  | <b>Putty.</b>                                  |  | Cocoanut, Ceylon..... 5 1/2 @ 5 1/4   |  |
| Oil, Red Seal..... 10 1/4 @                    |  | Sienna, American, Burnt and                   |  | In bulk..... \$1.90                            |  | Cocoanut, Cochiti..... 5 1/2 @ 6      |  |
| lots of 1 ton and over..... 10 1/4 @           |  | Powdered..... 1 1/2 @ 2                       |  | In bladders..... 2.40                          |  | Cod, Domestic..... 33 @ 35            |  |
| lots less than 1 ton..... 10 1/4 @             |  | Talc, French..... 100 @ 1 1/2                 |  | In cans, 12 lb to 25 lb..... 3.50              |  | Cod, Newfoundland..... 36 @ 38        |  |
| Discounts.—V. M. French Zinc.—Dis-             |  | Talc, American..... 90 @ 1 10                 |  | In cans, 1 lb to 5 lb..... 3.80                |  | Red Elaine..... 34 @ 36               |  |
| counts to buyers of 10 bbl. lots of one or     |  | Terra Alba, French, 100 lb..... 95 @ 100      |  |                                                |  | Red Saponified..... 4 1/2 @ 4 1/4     |  |
| assorted grades, 1 1/2; 25 bbls., 2 1/2; 50    |  | Terra Alba, English..... 95 @ 100             |  | <b>Spirits Turpentine.</b>                     |  | Olive, Italian, bbls..... 57 @ 60     |  |
| bbls., 4 1/2.                                  |  | Terra Alba, American No. 1..... 85 @ 100      |  | In Southern bbls..... 45 1/4 @                 |  | Neatsfoot, prime..... 48 @ 50         |  |
|                                                |  | Terra Alba, American No. 2..... 85 @ 100      |  | In machine bbls..... 46 @                      |  | Palm, prime, Lagos..... 5 1/2 @       |  |
|                                                |  | Umber, Turkey, Bnt. & Powd..... 2 1/4 @ 3 1/4 |  |                                                |  |                                       |  |
|                                                |  | Umber, Turkey, Raw & Powd..... 2 1/4 @ 3 1/4  |  |                                                |  |                                       |  |
|                                                |  | Umber, Bnt. Amer..... 1 1/2 @ 2               |  |                                                |  |                                       |  |
|                                                |  | Umber, Raw, Amer..... 1 1/2 @ 2               |  |                                                |  |                                       |  |
|                                                |  | Yellow, Chrome..... 10 @ 25                   |  |                                                |  |                                       |  |
|                                                |  | Vermilion, American Lead..... 10 @ 25         |  |                                                |  |                                       |  |
|                                                |  | Vermilion, Quicksilver, bulk..... 72 @        |  |                                                |  |                                       |  |
|                                                |  | Vermilion, Quicksilver, bags..... 73 @        |  |                                                |  |                                       |  |
|                                                |  | Vermilion, English, Import..... 81 @ 95       |  |                                                |  |                                       |  |
|                                                |  | Vermilion, Chinese..... 88 @ 95               |  |                                                |  |                                       |  |
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## CARY'S BOX STRAPPING.

MADE IN VARIOUS WIDTHS.

CARY MFG. CO., 19 & 21 Roosevelt St., New York.

### WHY ARE WE LEADERS?

BECAUSE the largest consumers acknowledge the Superior quality of our

Scrap Copper, Scrap Brass, Scrap Lead, Scrap Zinc,  
and all kinds of old Metals. Write for prices to

**THEODORE HOFELLER & CO.**

98, 100, 102 TERRACE, BUFFALO, N. Y.

All Metals Carefully GRADED and Made FREE of Iron.

1875 **COVERT'S** 1900



N. Y., U. S. A.

THE IVES PATENT DOOR BOLTS,

Sash Locks

and WINDOW

HARDWARE

SPECIALTIES

LEADERS WITH

THE TRADE.

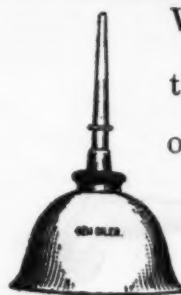
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H. B. IVES & CO., New Haven, Conn.

# OURWAY IRON

Equal to Best Swedish and Norway.

ESTABLISHED 1845.

**BROWN & CO., INC.,**  
PITTSBURGH, PA.

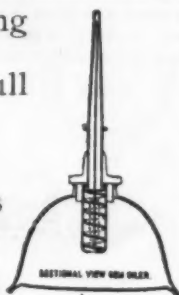


We were advised we were making  
the Gem Oiler too good—too full  
of good points.

Why, man, that's what makes  
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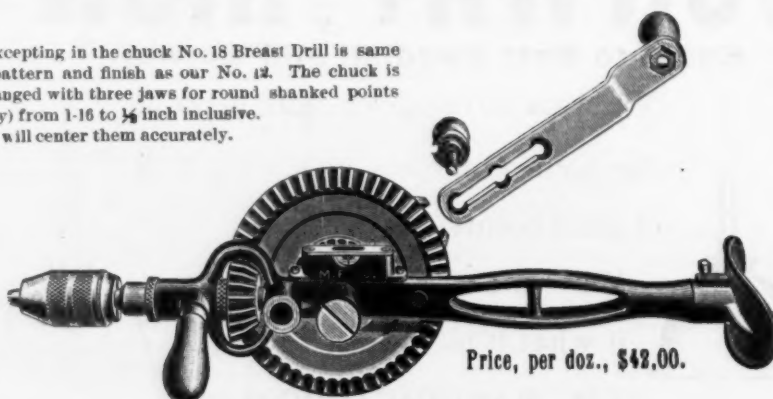


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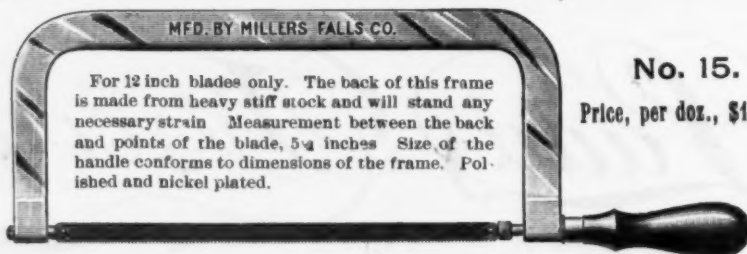
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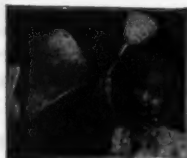
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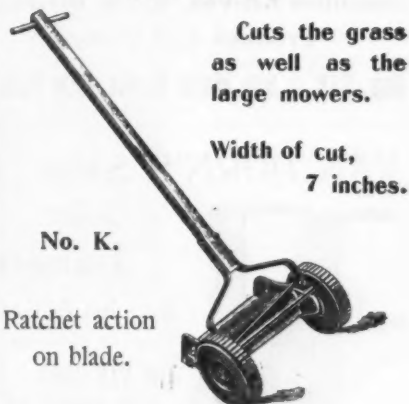
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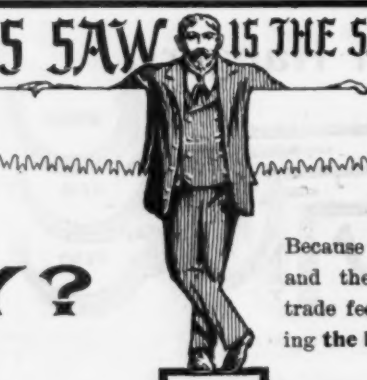
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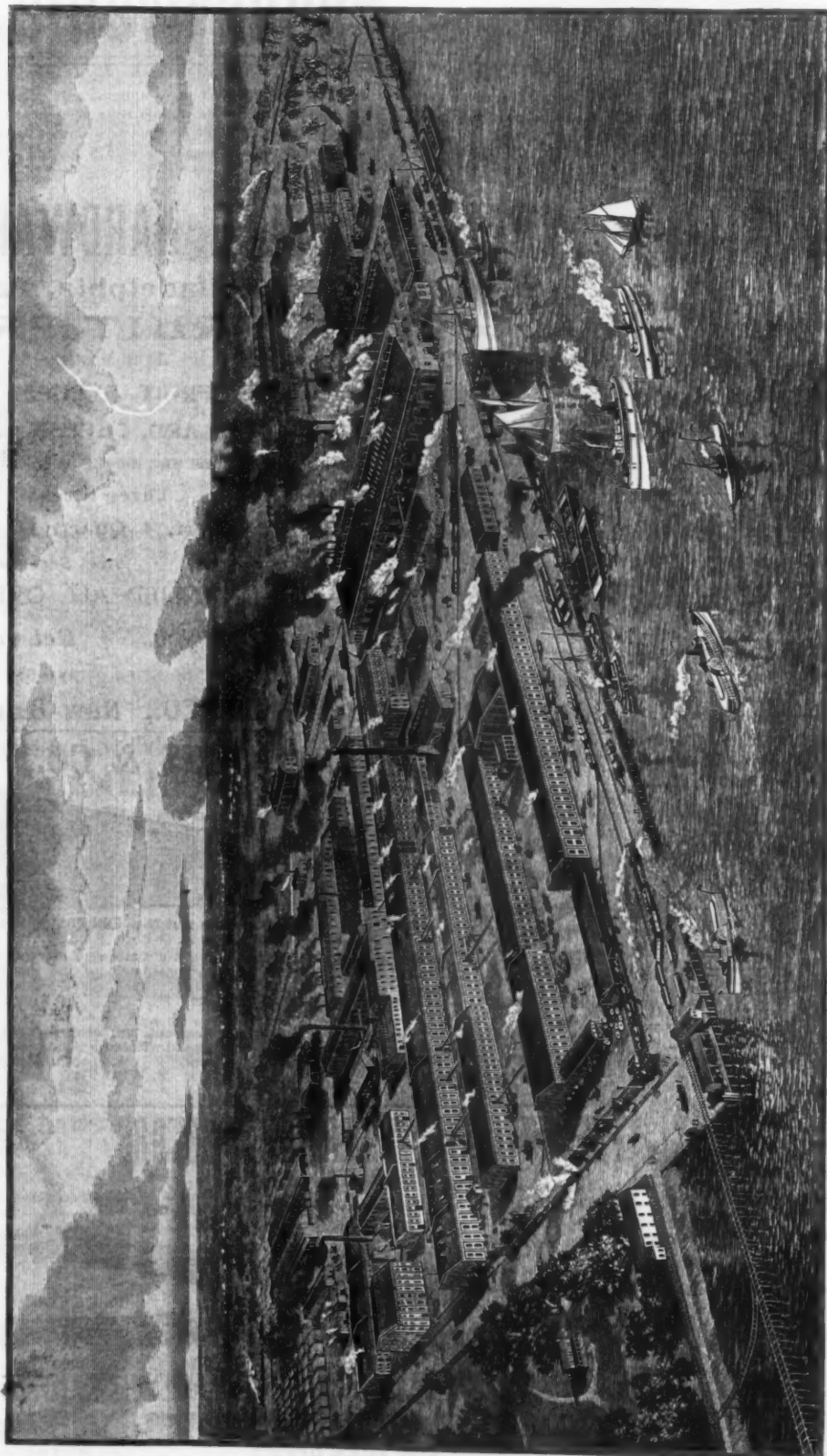
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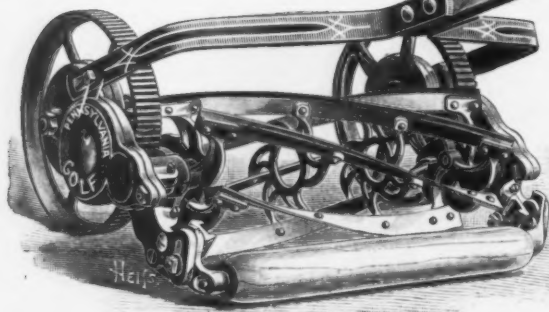
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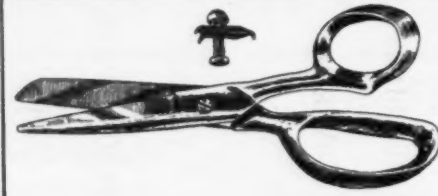
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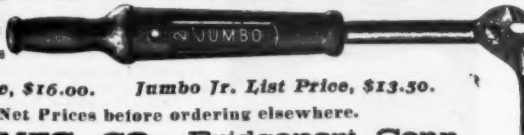
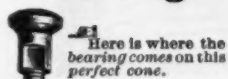
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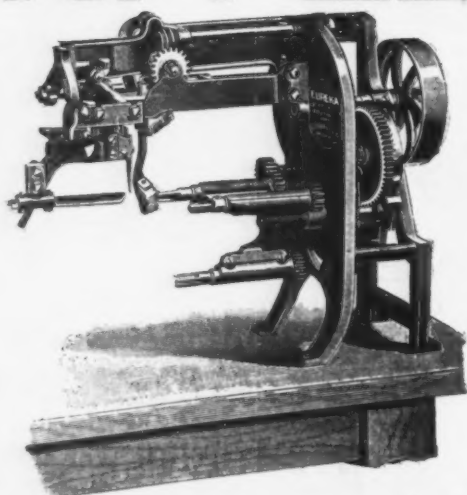
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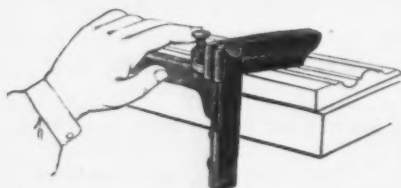
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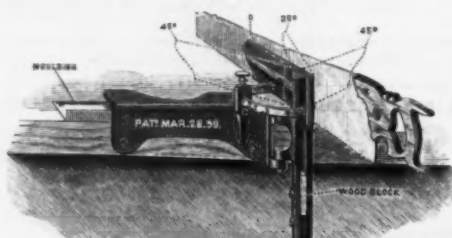
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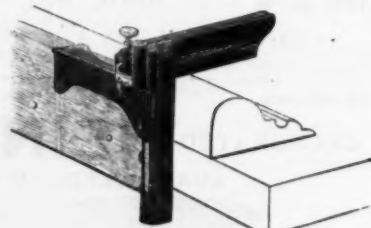


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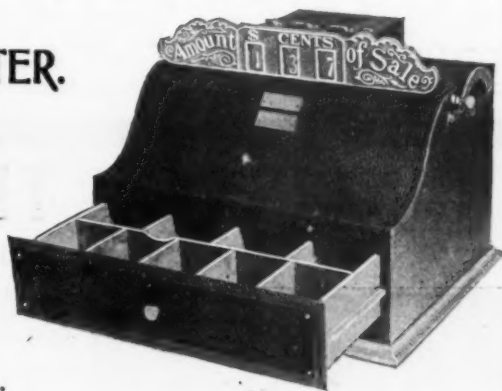
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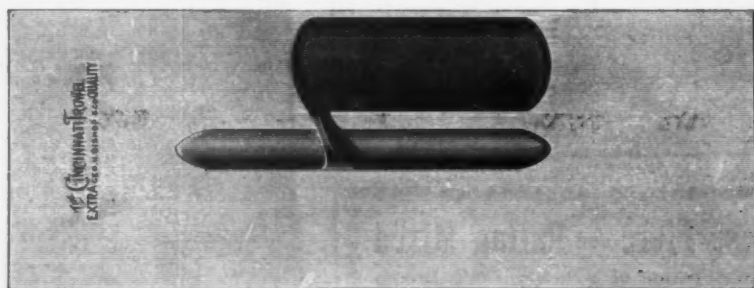
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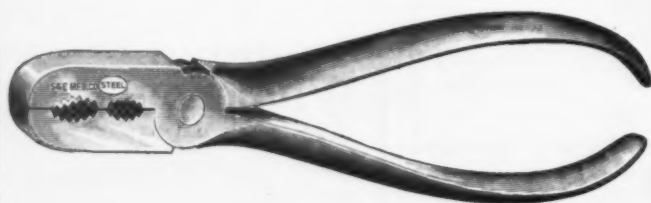
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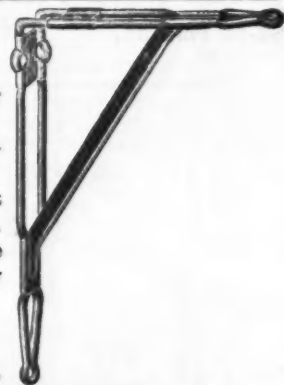
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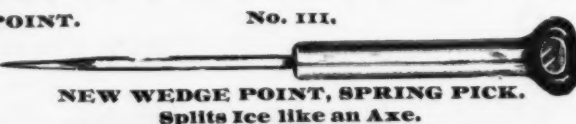
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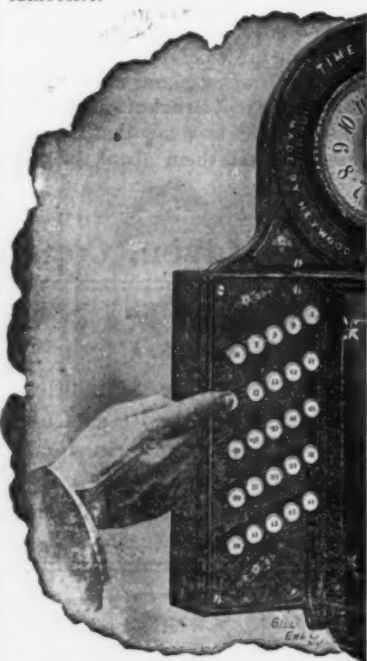


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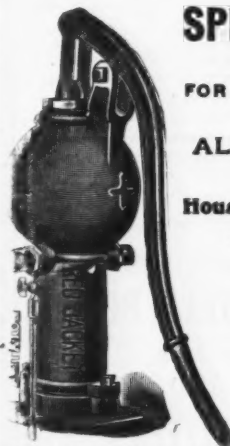
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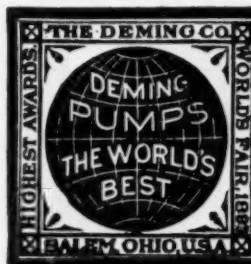
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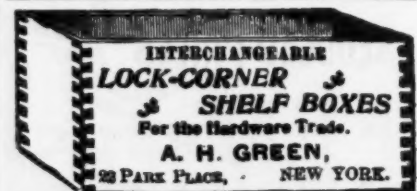
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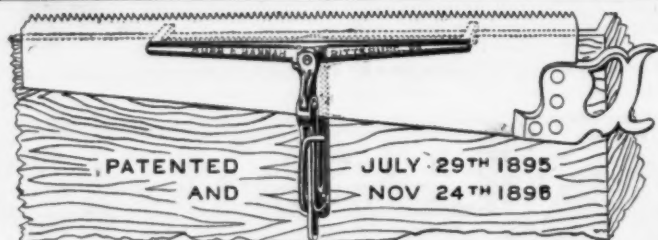
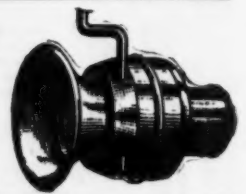


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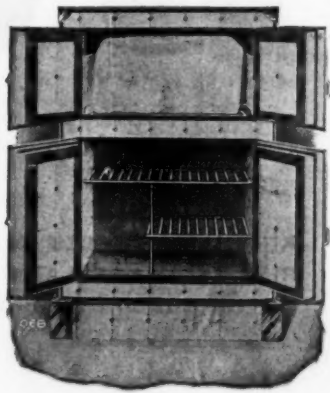


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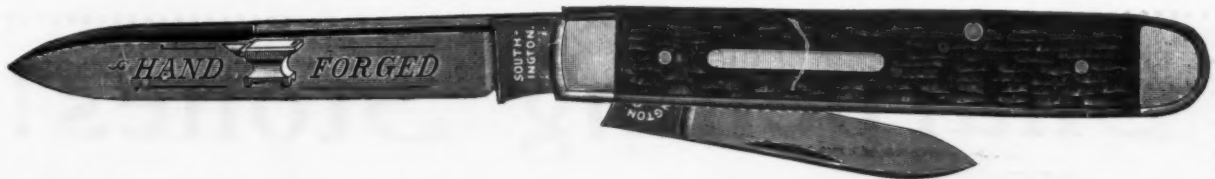
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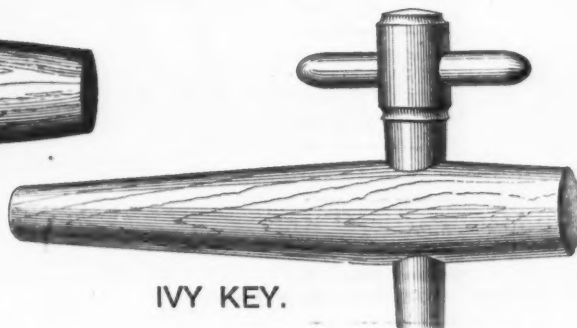


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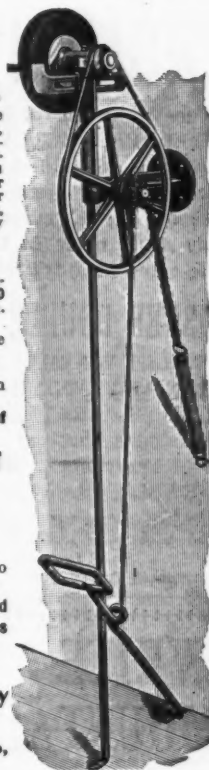
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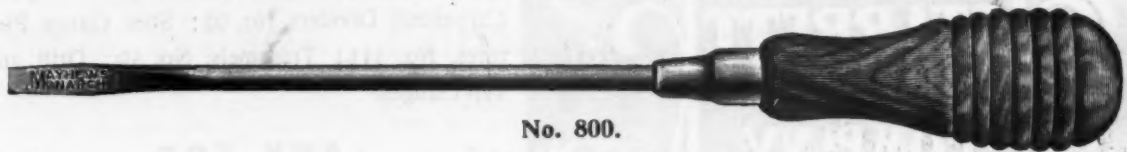
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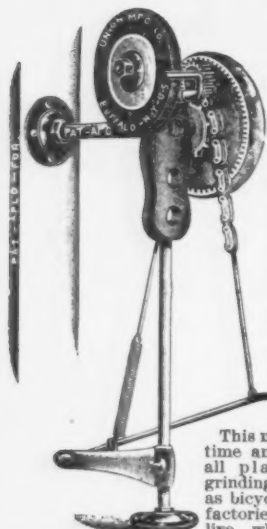
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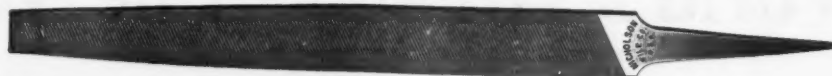
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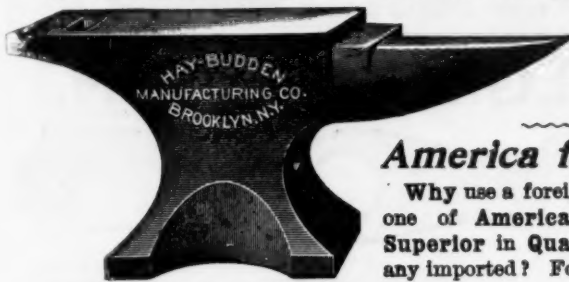


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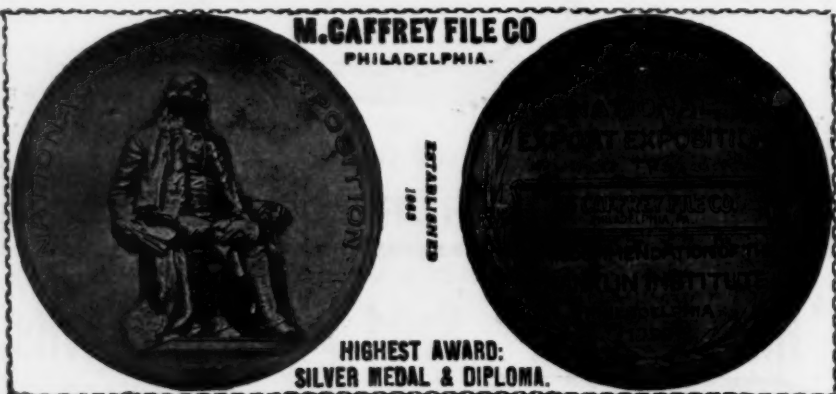
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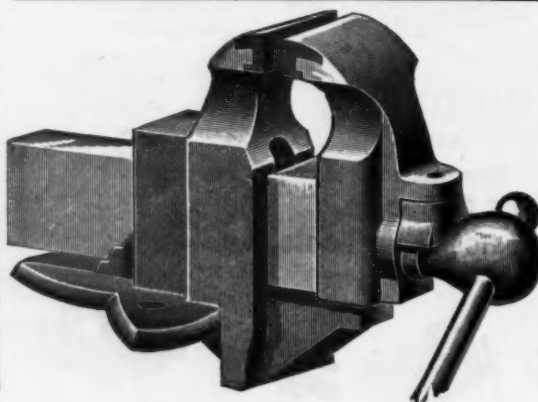


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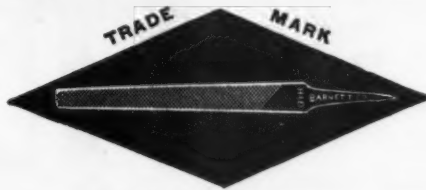
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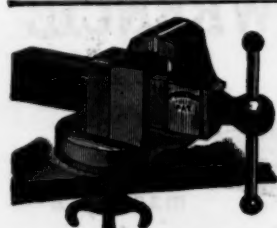


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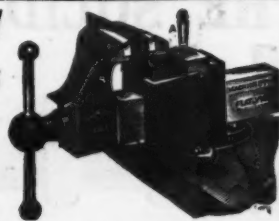
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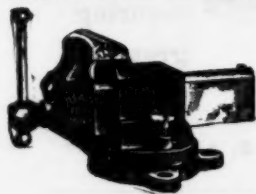


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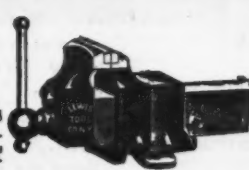
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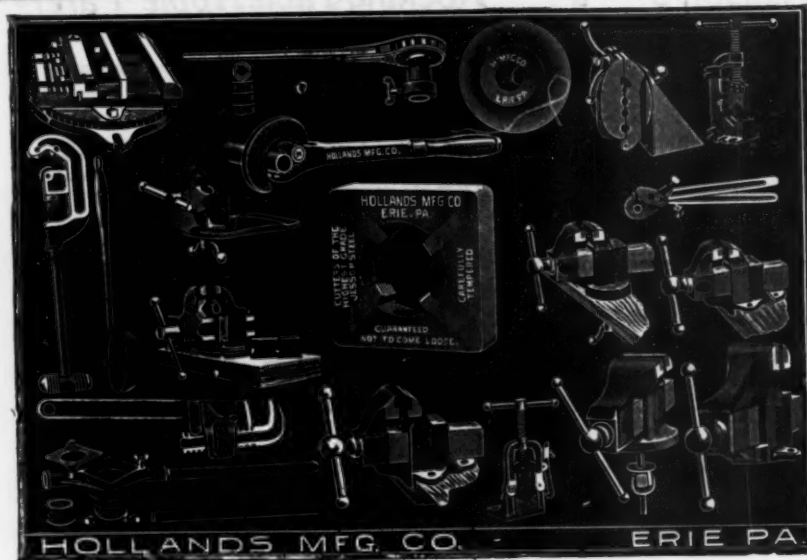
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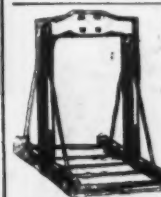
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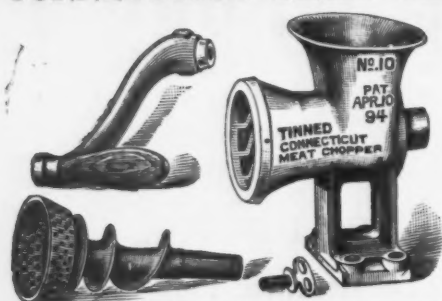
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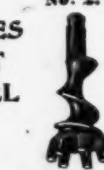
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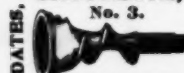


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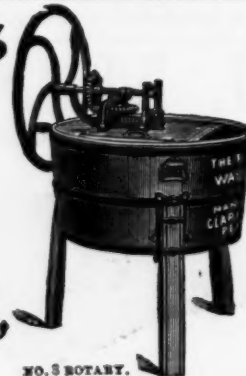
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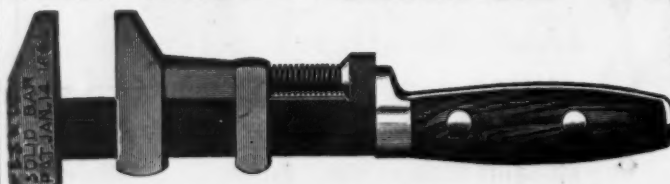
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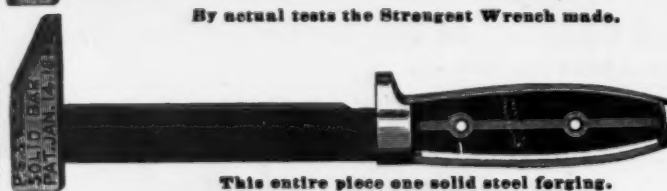


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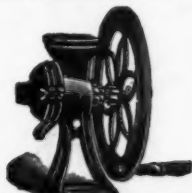
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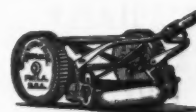
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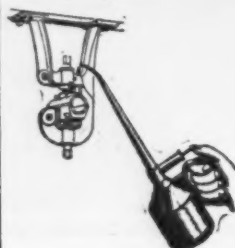


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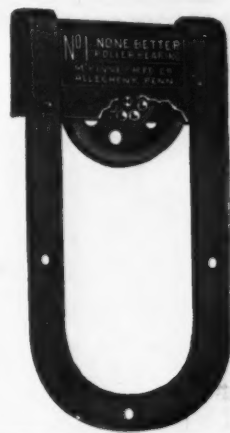
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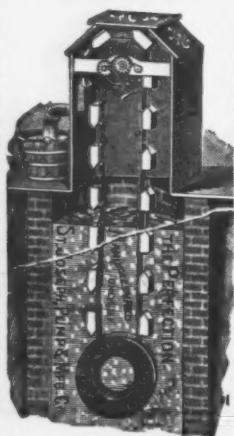
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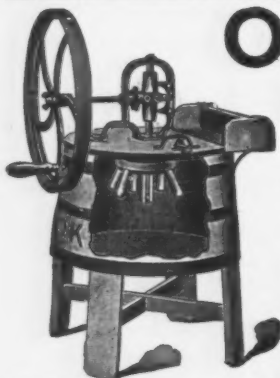
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something that sets water a-sparkling with fresh air every time the wheel goes round. First-class Hardware, Pump and Implement Jobbers all know a good thing and handle the

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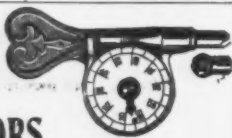
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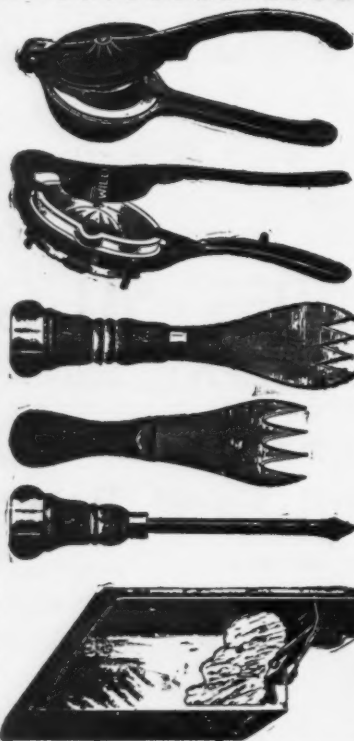
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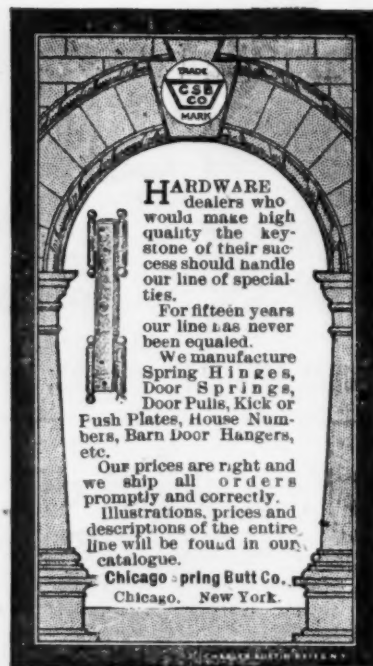
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Top Hanger made of Wrought Steel.

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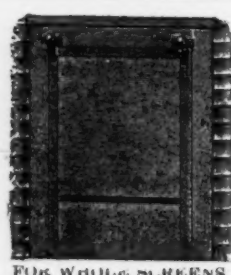


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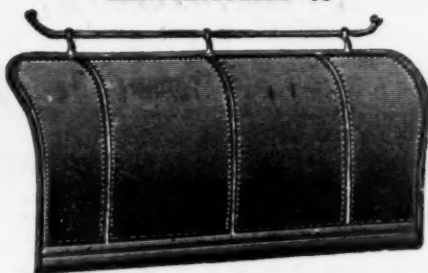
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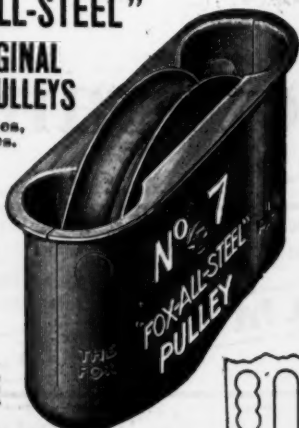


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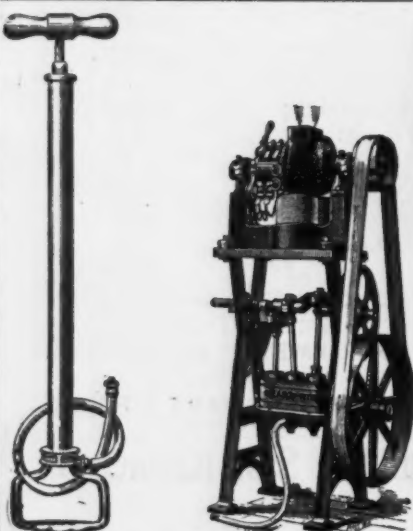
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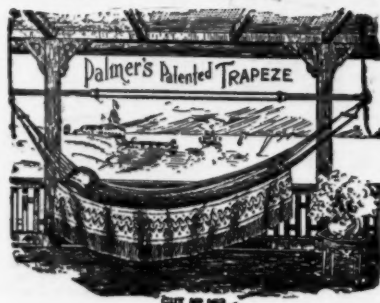


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The above Figure shows an Arawana slung from a Trapeze adjusted to its maximum extension as regards its suspension from the ceiling.

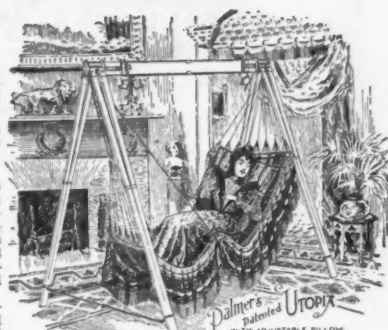
The Trapeze Suspension, as may be seen at a glance, is especially adapted to Veranda use, is adjustable to different sizes of Hammocks within its scope (from 6 ft. 3 in. to 11 ft.), and to giving different degrees of dip and heights of suspension. Every conceivable swinging motion is obtained without effort.

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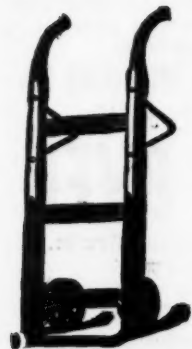
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|      |   |       |   |
|------|---|-------|---|
| " 2, | " | 2 1-4 | " |
| " 3, | " | 3 1-4 | " |
| " 4, | " | 4 1-4 | " |



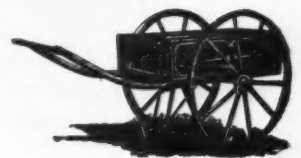
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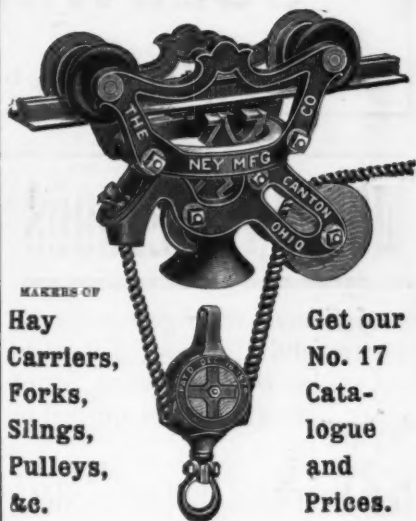
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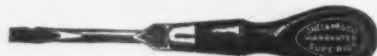
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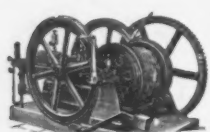
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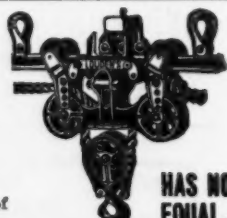


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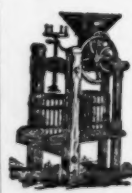
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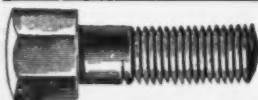


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| Laughlin, Alex. & Co.                  | 40     | <b>N</b>                                 | Pittsburgh Screw & Bolt Co. | 16                                       | Silver Lake Co. | 127                                 | U. S. Steel Lock Co. | 136                                    |        |
| Law, Ernest & Co.                      | 30     | Nanz, C. & Co.                           | 14                          | Pittsburgh Shear, Knife & Machine Co.    | 39              | Silver Mfg. Co.                     | 46                   | Universal Machine Co.                  | 57     |
| Lawrence Bros.                         | 126    | Narragansett Mch. Co.                    | 190                         | Pittsburg Steel Shafting Co.             | 26              | Simonds Mfg. Co.                    | 100                  | Up-to-date Mfg. Co.                    | 8      |
| Lea, J. Tatnall & Co.                  | 80     | Nash, Geo. & Co.                         | 80                          | Plumber & Henger Mfg. Co.                | 156             | Simplex Time Recorder Co.           | 108                  | Utica Drop Forge & Tool Co.            | 115    |
| LeCount, Wm. G.                        | 122    | National Abrasive Mfg. Co.               | 57                          | Plume & Atwood Mfg. Co.                  | 9               | Singer, Nimeck & Co.                | 29                   |                                        |        |
| Leffler, Chas. & Co.                   | 68     | National Cutlery Co.                     | 102                         | Plymouth Mills                           | 15              | Skinner Chuck Works.                | 61                   | <b>V</b>                               |        |
| Leong, Jno. S., Son & Co.              | 146    | National Elastic Nut Co.                 | 15                          | Pneumatic Crane Co.                      | 52              | Slate, Dwight Mch. Co.              | 64                   | Valentine, M. D. & Bro.                | 35     |
| Leonard, John & Co.                    | 90     | National Horse Nail Co.                  | 132                         | Pollock, W. B. Co.                       | 44              | Slocumb, J. T. & Co.                | 118                  | Van Dorn Iron Works Co.                | 100    |
| Leonhardt & Co.                        | 130    | National Machinery Co.                   | 60                          | Pond Machine Tool Co.                    | 76              | Sloss Sheffield Steel & Iron Co.    | 23                   | Van Wagoner & Williams                 |        |
| Leschen, A. & Sons Rope Co.            | 7      | National Pipe Bending Co.                | 48                          | Pooler, Robt. & Son Co.                  | 46              | Smith & Caffrey                     | 88                   | Hardware Co.                           | 146    |
| Levis, Henry & Co.                     | 32     | National Saw Co.                         | 100                         | Pope Sales Department                    | 138             | Smith & Egge Mfg. Co.               | 106                  | Variety Machine Co.                    | 54     |
| Lewis Tool Co.                         | 119    | National Sewing Machine Co.              | 122                         | Port Chester Bolt & Nut Co.              | 18              | Smith & Hemenway Co.                | 115                  | Velox Machine Works.                   | 118    |
| Lidgerwood Mfg. Co.                    | 146    | National Specialty Mfg. Co.              | 128                         | Portland Ladder Co.                      | 110             | Smith, M. B. Co.                    | 90                   | Virzina Iron Coal & Coke Co.           | 25     |
| Lilienberg, N.                         | 29     | National Steel Co.                       | 27                          | Potter & Johnston Co.                    | 75              | Smooth On Mfg. Co.                  | 69                   | Vitrified Emery Wheel Co.              | 56     |
| Lima Steel Castings Co.                | 31     | National Tube Co.                        | 30                          | Potts, Horace T. & Co.                   | 30              | Smythe, S. R. Co., Inc.             | 40                   | Vulcan Iron Works                      | 47     |
| Lindsay, W. W. & Co.                   | 24     | National Wire Corp.                      | 18                          | Poulter & Co.                            | 82              | Snell Mfg. Co.                      | 134                  | Vulcanus Forging Co.                   | 89     |
| Link-Belt Engineering Co.              | 52     | Naugatuck Mfg. Co.                       | 46                          | Pratt Chuck Co.                          | 52              | Snow, L. T.                         | 145                  |                                        |        |
| Livermore, Homer F.                    | 34-36  | Nazel & Bassett                          | 58                          | Pratt Whitney Co.                        | 75              | Snow Flake Axle Grease Co.          | 130                  | <b>W</b>                               |        |
| Lockhart Iron & Steel Co.              | 28     | Neas, Geo. M., Jr.                       | 119                         | Prentiss Bros. Co.                       | 50              | Snyder, W. P. & Co.                 | 28                   | Waggoner Watchman Clock                | 5      |
| Lodge & Shipley Mch. Tool Co.          | 82     | New Albany Mfg. Co.                      | 86                          | Prentiss, Geo. W. & Co.                  | 13              | Sommer's Son, John                  | 146                  | Wallace, Wm. H. & Co.                  | 23     |
| Logan Iron & Steel Co.                 | 90     | New Brunswick Fdry Co.                   | 86                          | Prentiss Tool & Supply Co.               | 84              | Southern Railway Co.                | 87                   | Wardlow, S. & C.                       | 28     |
| Logan & Strubridge Iron Co.            | 102    | New Century Mfg. Co.                     | 89                          | Prentiss Vise Co.                        | 119             | Southington Cutlery Co.             | 111                  | Ward, Edgar T. & Sons                  | 34     |
| Lombart Iron Works & Supply Co.        | 86     | New Doty Mfg. Co.                        | 78                          | Presbrey Fire Brick Co.                  | 37              | Southwark Fdry. & Mch. Co.          | 45                   | Warner Bros. Co.                       | 18     |
| Lorain Foundry Co.                     | 32     | New England Steel Casting Co.            | 81                          | Pugh, Job T.                             | 108             | Spaidel, J. G.                      | 43                   | Warren City Boiler Works               | 44     |
| Lorain Steel Co.                       | 29     | New England Structural Co.               | 19                          | Pullman, J. Wesley                       | 30              | Spencer's, I. S. Sons               | 33                   | Warren, J. D. Mfg. Co.                 | 112    |
| Louden Mch. Co.                        | 136    | Newhall, Henry B.                        | 14                          | Pullman Sash Balance Co.                 | 127             | Spencer Automatic Mch. Screw Co.    | 146                  | Washburn Shops                         | 53     |
| Loyd, John                             | 100    | New Haven Mfg. Co.                       | 67                          | Putnam Nail Co.                          | 153             | Spencer Wire Co.                    | 18                   | Washington Coal & Coke Co.             | 38     |
| Ludlow-Saylor Wire Co.                 | 8      | New Haven Wire Mfg. Co.                  | 5                           | <b>Q</b>                                 |                 | Spofford, W. S. & Son               | 35                   | Waterbury Brass Co.                    | 2      |
| Lufkin Rule Co.                        | 106    | N. J. Iron & Metal Co.                   | 90                          | Quint, A. D.                             | 60              | Springfield Drop Forging Co.        | 128                  | Waterbury Farrel Foundry & Machine Co. | 18     |
| Lukens Iron & Steel Co.                | 27     | N. J. Wire Cloth Co.                     | 12                          | <b>R</b>                                 |                 | Springfield Mch. Screw Co.          | 116                  | Waterbury Rope Co.                     | 6      |
| Lund, S. T.                            | 84     | Newkirk, J. B. & Co.                     | 80                          | Ramapo Car Wheel Co.                     | 37              | Springfield Mfg. Co.                | 56                   | Watson, E. P.                          | 41     |
| Lyon, N.                               | 99     | Newport News Shipbuilding & Dry Dock Co. | 45                          | Rand Drill Co.                           | 46              | Standard Chain Co.                  | 107                  | Watson, N. A.                          | 41     |
| <b>M</b>                               |        | New Process Twist Drill Co.              | 59                          | Randolph-Cloves Co.                      | 2               | Standard Co.                        | 98                   | Watson-Stillman Co.                    | 63     |
| McCabe, J. J.                          | 70-82  | N. Y. Air Compressor Co.                 | 47                          | Randolph Iron Co.                        | 34              | Standard Fdry. & Mfg. Co.           | 35                   | Wayne, Anthony Mfg. Co.                | 130    |
| McCabe Hanger Mfg. Co.                 | 14-126 | N. Y. Blower Co.                         | 67                          | Rawson Electric Co.                      | 135             | Standard Scale & Supply Co.         | 67                   | Weber Gas & Gasoline Engine Co.        | 106    |
| McCaffrey File Co.                     | 118    | N. Y. Machinery Depot                    | 82                          | Read, A. P. & Co.                        | 123             | Standard Tool Co.                   | 58                   | Webster, Warren & Co.                  | 43     |
| McClure, G. W., Son & Co.              | 40     | N. Y. Stamping Co.                       | 107                         | Read, Wm. A. & Co.                       | 86              | Standard Varnish Works              | 122                  | Welch, T. F. Mfg. Co.                  | 3      |
| McCooy, Jos. F. Co.                    | 53     | Ney Mfg. Co.                             | 133                         | Reading Crane & Hoist Works              | 53              | Stanley Rule & Level Co.            | 107                  | Wellman Seaver Engineering Co.         | 40     |
| McCullough Iron Co.                    | 23     | Niagara Machine & Tool Works             | 69                          | Reading Foundry Co.                      | 19              | Stanley Works                       | 136                  | Wells Bros. & Co.                      | 62     |
| McDowell, Stocker & Co.                | 83     | Niagara Screw Co.                        | 15                          | Reading Hardware Co.                     | 99              | Star Corundum Wheel Co.             | 56                   | Westinghouse Electric & Mfg. Co.       | 43     |
| McFarland, Wm.                         | 6      | Nicholson File Co.                       | 117                         | Reading Screw Co.                        | 18              | Star Heel Plate Co.                 | 108                  | West Side Foundry Co.                  | 89     |
| McGowan, J. H. & Co.                   | 47     | Nicol & Co.                              | 102                         | Red Jacket Mfg. Co.                      | 109             | Star Mfg. Co.                       | 118                  | Wetherill, Robt. & Co.                 | 145    |
| McInnes, C. E.                         | 27     | Nicoll, B. & Co.                         | 89                          | Reed & Curtis Mch. Screw Co.             | 14              | Starr Bros. Bell Co.                | 128                  | Wheeler, Mifflin & Co.                 | 82     |
| McKay, Jas. & Co.                      | 30     | Niles Tool Works Co.                     | 83                          | Rees, E. F. Co.                          | 64              | Stattler-Blechoff Co.               | 25                   | Wheeling Hinge Co.                     | 95     |
| McKinney Mfg. Co.                      | 123    | Nilson, A. H. Mch. Co.                   | 75                          | Reeves, Paul S.                          | 146             | Steel Rail Supply Co.               | 90                   | Wheeling Mold & Fdry Co.               | 85     |
| McKinnon Dash Co.                      | 125    | North American Metalline Co.             | 3                           | Remington Arms Co.                       | 130             | Stevens, J. Arms & Tool Co.         | 88                   | Wheelock, Lovejoy & Co.                | 28     |
| McNab & Harlin Mfg. Co.                | 44     | North Bros. Mfg. Co.                     | 96                          | Republic Iron & Steel Co.                | 14-145          | Steward D. M. Mfg. Co.              | 118                  | Whitcomb Mfg. Co.                      | 71     |
| Machinists' Supply Co.                 | 49     | Northampton Emery Wheel Co.              | 55                          | Rhode Island Tool Co.                    | 17              | Stewart & Romaine Mfg. Co., Ltd.    | 18                   | White, L. & I. J. Co.                  | 108    |
| Magnolia Metal Co.                     | 1      | Northern Engineering Works               | 44-33                       | Richard Mfg. Co.                         | 86              | Stewart Iron Works                  | 14                   | White Mt. Freezer Co.                  | 114    |
| Main Belting Co.                       | 49     | Norton Emery Wheel Co.                   | 55                          | Richmond Cedar Works                     | 130             | Stewart Wire Co.                    | 7                    | Whitehurst, R. W. & Co.                | 136    |
| Maine Mfg. Co.                         | 123    | Norton Mfg. Co.                          | 107                         | Ridgway, Craig & Son Co.                 | 81              | Stokes Bros. Mfg. Co.               | 118                  | Whiting Mfg. Co.                       | 105    |
| Manning, Maxwell & Moore               | 84     | Norwalk Iron Works Co.                   | 47                          | Ripley & Bartlett                        | 14              | Storm Mfg. Co.                      | 131                  | Whitlock Coal Pipe Co.                 | 44     |
| Manogue-Pidgeon Iron Co.               | 86     | Nut & Washer Mfg. Co.                    | 15                          | Ritter-Conley Mfg. Co.                   | 19              | Stoutenburg Mfg. Co.                | 122                  | Whitton, D. E. Mch. Co.                | 61     |
| Manville Machine Co., E. J.            | 81     | Nuttall, R. D. Co.                       | 74                          | Roberts, A. & P. & Co.                   | 98              | Stow Flexible Shaft Co.             | 60                   | Wickwire Bros.                         | 13     |
| Markham Air Rifle Co.                  | 130    | <b>O</b>                                 |                             | Rockford Bolt Works                      | 17              | Stow Mfg. Co.                       | 60                   | Wiebusch & Hilger, Ltd.                | 114    |
| Marble Lead Works                      | 93     | Obermayer, S. Co.                        | 38                          | Rockwell Engineering Co.                 | 40              | Stowell Mfg. & Fdry. Co.            | 125                  | Wilbraham-Baker Blower Co.             | 74     |
| Marlin Fire Arms Co.                   | 129    | Oefinger, J. L.                          | 127                         | Rogers, M. H.                            | 90              | Streeter, N. R. & Co.               | 121                  | Wilcox Mfg. Co.                        | 125    |
| Marshall & Huschart Machy. Co.         | 85     | Ogden & Wallace                          | 29                          | Rogers, Jno. M. Boat, Gauge & Drill Wks. | 78              | Strieby & Foote Co.                 | 128                  | Wilder, S. & Co.                       | 108    |
| Mason & Parker                         | 103    | Onida Community                          | 104                         | Rossiter, McGovern & Co.                 | 83              | Stroud, E. H. & Co.                 | 32                   | Wiley & Russell Mfg. Co.               | 64-146 |
| Mason Regulator Co.                    | 45     | Ormsby, E. A.                            | 14                          | Rossman Woven Wire Fence Co.             | 8               | Sturtevant, B. F. Co.               | 80                   | Wilke Mfg. Co.                         | 111    |
| Matthiessen & Hegeler Zinc Co.         | 2      | Ornamental Iron & Wire Co.               | 8                           | Rowland, William & Harvey                | 146             | Superior Charcoal Iron Co.          | 29                   | Williams, A. C.                        | 124    |
| Maurer, H. & Son                       | 35     | Osborn Mfg. Co.                          | 105                         | Rudolph & Krummel                        | 70              | Supplier Hardware Co.               | 102                  | Williams, J. H. & Co.                  | 54     |
| May & Spalding                         | 90     | Ossawau Mills Co.                        | 145                         | Rutter, A. T.                            | 2               | Sweetzer, W. A.                     | 14                   | Williams, White & Co.                  | 69     |
| Mayhew, H. H. Co.                      | 115    | Ostrander Fire Brick Co.                 | 85                          | Ryan, J. J. & Co.                        | 2               | Swindell, W. & Bros.                | 40                   | Williamsport Wire Rope Co.             | 7      |
| Maywood Fdry & Mch. Co.                | 39     | Ostrander, W. R. & Co.                   | 110                         | <b>S</b>                                 |                 | Syracuse Chilled Plow Co.           | 125                  | Wilson Aluminum Co.                    | 28     |
| Merchant & Co.                         | 8      | Otis Steel Co.                           | 81                          | Sabin Machine Co.                        | 5               | <b>T</b>                            |                      | Wilmart & Norman                       | 6      |
| Merrell Mfg. Co.                       | 63     | <b>P</b>                                 |                             | Safety Emory Wheel Co.                   | 56              | Tabor Mfg. Co.                      | 45                   | Wilmot & Hobbs Mfg. Co.                | 1-129  |
| Merrill Bros.                          | 1      | Palmer, I. E.                            | 129                         | Saginaw Mfg. Co.                         | 43              | Taintor Mfg. Co.                    | 119                  | Wilson, E. H. & Co.                    | 82     |
| Mersick C. S. & Co.                    | 71     | Palmer Hardware Mfg. Co.                 | 127                         | St. John Spring Co.                      | 5               | Talcott, W. O.                      | 51                   | Wilson, E. H. & Co.                    | 127    |
| Mesta Machine Co.                      | 32     | Paradox Machinery Co.                    | 84                          | St. Joseph Pump & Mfg. Co.               | 124             | Tanite Co.                          | 146                  | Wilson, H. P. & H. F.                  | 7      |
| Mianus Electric Co.                    | 136    | Pardee, C. Works                         | 25                          | St. Louis Electrotyp Foundry             | 95              | Taunton Locomotive Mfg. Co.         | 43                   | Wilson & Smith                         | 14     |
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Chicago Flexible Shaft Co., Chicago, Ill.  
McCoy, Jos. F. Co., 26 Warren St., N. Y.  
Webbush & Hilger, Ltd., 9-15 Murray St., N. Y.
- Clothes Dryers**  
Hill Dryer Co., Worcester, Mass.
- Clothes Line Hook**  
Wilson, E. H. & Co., Allston, Mass.
- Clothes Pins**  
U. S. Clothes Pin Co., Montpelier, Vt.
- Coal**  
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
Bessemer Coal Co., Pittsburgh, Pa.  
Cherry Valley Iron Co., Pittsburgh, Pa.  
Ditmick, J. K. & Co., Phila., Pa.  
Frick, H. C. Co., Pittsburgh, Pa.  
Houston, C. B. & Co., Philadelphia, Pa.  
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.  
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
Virginia Iron, Coal & Coke Co., Bristol, Va., Tenn.  
Washington Coal & Coke Co., Dawson, Pa.  
Wister, Francis, Philadelphia, Pa.
- Coal Cars**  
Lansing Wheelbarrow Co., Lansing, Mich.
- Coal Picks**  
Jenkins Iron & Tool Co., Howard, Pa.
- Coal Shutes**  
Lansing Wheelbarrow Co., Lansing, Mich.
- Coasters**  
Eclipse Bicycle Co., Elmhurst, N. Y.
- Coffee and Spice Mills**  
Arcade Mfg. Co., Freeport, Ill.  
Parker, Chas. Co., Meriden, Conn.
- Coke**  
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
Bessemer Coal Co., Pittsburgh, Pa.  
Cherry Valley Iron Co., Pittsburgh, Pa.  
Ditmick, J. K. & Co., Phila., Pa.  
Frick, H. C. Co., Pittsburgh, Pa.  
Houston, C. B. & Co., Philadelphia, Pa.  
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.  
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
Virginia Iron, Coal & Coke Co., Bristol, Va., Tenn.  
Washington Coal & Coke Co., Dawson, Pa.  
Wister, Francis, Philadelphia, Pa.
- Colleges**  
Ichigan College of Mines, Houghton, Mich.
- Compressed Air Machinery**  
Phila. Pneumatic Tool Co., Phila. Pa.
- Conductor Pipe**  
Berger Bros. Co., Philadelphia, Pa.
- Conveying Machinery**  
Aultman Co., Canton, Ohio.  
Brown Holding & Conveying Machine Co., Cleveland, Ohio.  
California Wire Works, San Francisco, Cal.  
Hunt, C. W. Co., W. New Brighton, N. Y.  
Jeffrey Mfg. Co., Columbus, O.  
Link-Belt Engineering Co., Phila., Pa.
- Cooking Utensils**  
Cleveland Stamping & Tool Co., Cleveland, O.
- Copper**  
Hendricks Bros., 49 Cliff, N. Y.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
United Metals Selling Co., 11 Broadway, N. Y.
- Copper Hammers**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Rail Bands**  
American Steel & Wire Co., Chicago, Ill.
- Copper Rivets and Burrs**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Tacks and Nails**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Wire, Bare and Insulated**  
American Steel & Wire Co., Chicago, Ill.
- Cordage**  
Samson Cordage Works, Boston, Mass.  
Silver Lake Co., Boston, Mass.
- Cordage Machinery**  
Hooves & Gamble Co., Miamisburg, O.
- Core Ovens**  
Millet Core Oven Co., Brightwood, Mass.
- Cork Screws and Cork Pullers**  
Erie Specialty Co., Erie, Pa.
- Corn Hooks**  
Withington & Cooley Mfg. Co., Jackson, Mich.
- Corn Huskers**  
Wilcox Mfg. Co., Aurora, Ill.
- Corrugated Iron and Steel**  
Garry Iron & Steel Roofing Co., Cleveland, O.  
McCallough Iron Co., Wilmington, Del.  
Scaife, Wm. B. & Sons, Pittsburgh.
- Corundum**  
National Abrasive Mfg. Co., Phila., Pa.
- Cotter Pin Machines, Automatic**  
Shuster, F. B. Co., New Haven, Conn.
- Cotton Ties**  
American Steel Hoop Co., Pittsburgh, Pa.
- Counting Machines**  
Durant, W. N. Milwaukee Wis.
- Couplings, Compression**  
Sennett, Geo. B. Co., Youngstown, O.
- Cow Ties**  
Garland Chain Co., Rankin, Pa.  
Onesida Community, Ltd., Niagara Falls, Pa.
- Cranes**  
Brown Hoisting & Conveying Mch. Co., Cleveland, O.  
Chisholm & Moore Mfg. Co., Cleveland, O.  
Cleveland Crane & Car Co., Cleveland, O.  
Northern Engineering Works, Detroit, Mich.  
Pawling & Harnischfeger, Milwaukee, Wis.  
Pneumatic Crane Co., Pittsburgh, Pa.  
Reading Crane & Hoist Wks., Reading, Pa.  
Ridgway, Craig & Son Co., Coatesville, Pa.  
Spindel, J. G., Reading, Pa.
- Crayon**  
Steward, D. M. Mfg. Co., Chattanooga, Tenn.
- Crucibles**  
Dixon, Jos. Crucible Co., Jersey City, N. J.
- Cupolas**  
Faxon, J. W. Co., Philadelphia, Pa.
- Cupolas, Hot Blast**  
Byram & Co., Detroit, Mich.
- Curry Combs**  
New York Stamping Co., Brooklyn, N. Y.
- Cutlery**  
Cadmus Cutlery Co., Little Valley, N. Y.  
Chaffin, John & Sons, 85 to 89 Cliff St., N. Y.  
Dane, Stoddard & Co., Boston.  
Goodell Co., Antrim, N. H.  
Kimball, C. J. Co., Huntington, N. H.  
Smith & Hemenway Co., 236 Broadway, N. Y.  
Southington Cutlery Co., Southington, Conn.  
Webbush & Hilger, Ltd., 9 to 15 Murray St., N. Y.
- Cutting Off Machines**  
Hurlbut Rogers Mach. Co., So. Sudbury, Mass.
- Dampers**  
Williams, A. C., Ravenna, O.
- Dashes and Fenders**  
McKinnon Dash Co., Buffalo, N. Y.
- Diamond Tools**  
Dickinson, Thos. L., 45 Vesey St., N. Y.
- Dies**  
Adrian Mach. Works, Brooklyn, N. Y.  
American Hdw. Mfg. Co., Ottawa, Ill.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Ferracuti Mach. Co., Bridgeport, N. J.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Mossberg, Frank Co., Attleboro, Mass.  
Richard Mfg. Co., Bloomsburg, Pa.  
Wilson & Smith, Worcester, Mass.
- Door Bells**  
See Bells and Gongs.
- Door Checks and Springs**  
Bardsley, Jos., 147 151 Baxter St., N. Y.  
Pullman Sash Balance Co., Rochester, N. Y.
- Door Holders**  
Brohard Co., Phila., Pa.  
Caldwell Mfg. Co., Rochester, N. Y.
- Draught Springs**  
Burditt & Williams, Boston, Mass.
- Draw Benches**  
Richard Mfg. Co., Bloomsburg, Pa.  
Thompson, Hugh L., Waterbury, Ct.
- Drill Grinders**  
Heald, L. S. & Son, Barre, Mass.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.  
Williams & Norman, Grand Rapids, Mich.
- Drilling Machines**  
Barnes, R. F. Co., Rockford, Ill.  
Barnes, W. F. & John Co., Rockford, Ill.  
Baush Mch. Tool Co., Springfield, Mass.  
Bickford Drill & Tool Co., Cin., Ohio.  
Bullard Machine Tool Co., Bridgeport, Ct.  
Burnham, Geo. Co., Worcester, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.
- Cincinnati Mch. Tool Co., Cincinnati, O.**  
Dallett, Thos. H. & Co., Philadelphia.  
Dumont & Littledale Mch. Co., 131 Worth St., N. Y.  
Davis, W. F., Machine Co., Rochester, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Harrington, E. Son & Co., Phila., Pa.  
Hill, Clarke & Co., Boston, Mass.  
Hoefler Mfg. Co., Freeport, Ill.  
Premice Bros., Worcester, Mass.  
Quint, A. D., Hartford, Conn.  
Shuster, F. B. Co., New Haven, Conn.  
Union Tire Co., Lindsail, N. J.  
Sigourney Tool Co., Hartford, Conn.  
Silver Mfg. Co., Salem, O.  
Slate Dwight Machine Co., Hartford, Ct.  
Stow Flexible Shaft Co., Phila., Pa.  
Union Tire Co., Lindsail, N. J.  
Wiley & Russell Mfg. Co., Greenfield, Mass.  
York, S. M. Co., Cleveland, O.
- Drilling Machines, Automatic**  
Gould & Eberhardt, Newark, N. J.
- Drills, Pneumatic**  
Chicago Pneumatic Tool Co., Chicago, Ill.
- Drop Forgings**  
Selden Machine Co., New Haven, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Chicago Drop Forging & Fdry. Co., Kensington, Ill.  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Consolidated Railway Electric Lighting & Equipment Co., 100 Broadway, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Indianapolis Drop Forging Co., Indianapolis, Ind.  
Keystone Drop Forge Co., Philadelphia.  
Kilborn & Bishop Co., New Haven, Conn.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Seward, W. & Son Co., New Haven, Ct.  
Springfield Drop Forging Co., Springfield, Mass.  
Stribley & Foote Co., Newark, N. J.  
Tranque & Williams Co., Alliance, O.  
Williams, J. H. & Co., Brooklyn, N. Y.  
Worman & Gordon, Worcester, Mass.
- Drop Hammers**  
Billings & Spencer Co., Hartford, Conn.  
Williams, White & Co., Moline, Ill.
- Drop Presses**  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Miner & Peck Mfg. Co., New Haven, Ct.  
Morse & Granville Mfg. Co., Providence, R. I.  
Vulcan Iron Works, Chicago, Ill.
- Dumb Waiters**  
Energy Mfg. Co., Philadelphia, Pa.  
Spindel, J. G., Reading, Pa.  
Storm Mfg. Co., Newark, N. J.  
Variety Machine Co., Warsaw, N. Y.
- Dump Cars**  
Atlas Bolt & Screw Co., Cleveland, O.
- Dynamos**  
Eddy Electric Mfg. Co., Windsor, Conn.  
General Electric Co., Schenectady, N. Y.  
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Eave Trough Hangers**  
Berger Bros. Co., Philadelphia, Pa.  
Oatman Bros., Medina, O.
- Edge Tools**  
Buck, Chas., Millbury, Mass.  
Buck Bros., Millbury, Mass.  
Ferro-Carbon Castings Co., Phila. Pa.  
White, L. & J. Co., Buffalo, N. Y.
- Egg Beaters**  
Lyon, Nelson, Albany, N. Y.  
Standard Co., Boston, Mass.
- Egg Opener**  
Hartigan, W. R., Collinsville, Ct.
- Electric Bells and Supplies**  
Ostrander, W. R. & Co., 204 Fulton St.
- Electric Controllers**  
Electric Controller & Supply Co., Cleveland, O.
- Electric Lighting and Power Apparatus**  
Eddy Electric Mfg. Co., Windsor, Conn.  
General Electric Co., Schenectady, N. Y.
- Electrical Apparatus**  
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Electrical Supplies**  
Mianus Electric Co., Mianus, Conn.
- Electrotypes**  
St. Louis Electrotype Foundry, St. Louis, Mo.
- Elevators, Makers of**  
Eastern Machinery Co., New Haven, Ct.  
Link-Belt Engineering Co., Phila., Pa.  
Energy Mfg. Co., Phila., Pa.  
Morse, Williams & Co., Phila., Pa.  
Ridgway, Craig & Son Co., Coatesville, Pa.  
Spindel, J. G., Reading, Pa.  
Variety Machine Co., Warsaw, N. Y.
- Elevator Buckets**  
Clark, W. J. & Co., Salem, O.  
Cleveland Elevator Bucket Co., Cleveland, O.
- Elevator Enclosures and Cabs**  
Ludlow Saylor Wire Co., St. Louis, Mo.
- Emery**  
Tanite Co., Stroudsburg, Pa.
- Emery Wheels**  
American Emery Wheel Works, Providence, R. I.  
Best, L. & Vesey St., N. Y.  
Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.  
Buffalo Emery Wheel Co., Buffalo, N. Y.  
Diamond Mach. Co., Providence, R. I.  
Nagel & Bassett, Phila., Pa.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Safety Emery Wheel Co., Springfield, O.  
Springfield Mfg. Co., Bridgeport, Conn.  
Star Corundum Wheel Co., Detroit, Mich.
- Sterling Emery Wheel Co., Tiffin, O.**  
Tanite Co., Stroudsburg, Pa.  
Vitrified Emery Wheel Co., Westfield, Mass.  
Zacharias & Co., Asbury Park, N. J.
- Emery Wheel Dresser**  
Chicago Screw Co., Chicago, Ill.  
Dickinson, Thos. L., 45 Vesey St., N. Y.
- Enameling**  
Baltimore Enamel Co., Baltimore, Md.
- Engineers and Contractors**  
Aiken, Henry, Pittsburgh, Pa.  
Erikson, Edw. E., Pittsburgh, Pa.  
Filer & Stowell Co., Milwaukee, Wis.  
Hevi & Patterson, Pittsburgh, Pa.  
Huber, S. V. Co., Pittsburgh, Pa.  
Kennedy, Julian, Pittsburgh, Pa.  
Kennedy, Walter, Pittsburgh, Pa.  
Lamond, David, Pittsburgh, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
McClure, G. W. Son & Co., Pittsburgh, Pa.  
Miller Engineering Co., Pittsburgh, Pa.  
Morgan Construction Co., Worcester, Mass.  
Penna. Engineering Wks., New Castle, Penna.  
Ritter-Conley Mfg. Co., Pittsburgh, Pa.  
Smythe, S. K. Co., Inc., Pittsburgh, Pa.  
Swindle, W. & Bros., Pittsburgh, Pa.  
Thompson, Hugh L., Waterbury, Ct.  
Wellman-Seaver Engineering Co., Cleveland, O.
- Engines**  
Gas.  
Mietz, Aug., 123-125 Mott St., N. Y.  
Northern Engineering Works, Detroit, Mich.  
Woolley Fdry. & Mch. Works, Anderson, Ind.  
Gasoline.  
Charter Gas Engine Co., Sterling, Ill.  
Weber Gas & Gasoline Engine Co., Kansas City, Mo.  
Watkins, F. M., Cincinnati, O.  
Woolley Fdry. & Mch. Works, Anderson, Ind.  
Kerosene.  
Mietz, Aug., 123-125 Mott St., N. Y.  
Steam.  
Allis, E. P. Co., Milwaukee, Wis.  
Boston Blower Co., Hyde Park, Mass.  
Buffalo Forge Co., Buffalo, N. Y.  
Filer & Stowell Co., Milwaukee, Wis.  
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.  
Sennett, Geo. B. Co., Youngstown, O.  
Southwark Fdry. & Mch. Co., Philadelphia, Pa.  
Scurtevant, B. F. Co., Boston, Mass.  
Tod, William & Co., Youngstown, O.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
Wetherill, Robt. & Co., Chester, Pa.
- Engines, Marine**  
Lake City Engineering Co., Erie, Pa.
- Engines, Second Hand**  
Everson, B. M., Pittsburgh, Pa.
- Engravers**  
Mugford A., Hartford, Conn.
- Expanding Mandrels**  
LeCount, Wm. G., So. Norwalk, Conn.
- Expansion Bolts**  
Church, Isaac Toledo, O.  
McCabe Hanger Mfg. Co., 333-343 W. 2nd St., N. Y.  
Newhall Henry R. Co., N. Y.  
Seaman, D. C. & Co., Philadelphia, Pa.  
Steward & Romaine Mfg. Co., Phila., Pa.
- Farmers' Tools**  
Heller Bros. & Co., Newark, N. J.
- Faucets, Wooden**  
Boston & Lockport Block Co., Boston, Mass.  
Sommer's, John, Son, Newark, N. J.
- Feed Cutters**  
Silver Mfg. Co., Salem, O.
- Feed Water Heaters and Purifiers**  
Harrison Safety Boiler Works, Philadelphia, Pa.  
Kelly, B. F. & Son, 91 Liberty St., N. Y.  
National Pipe Bending Co., New Haven, Conn.  
Patterson, F. L., 136 Liberty St., N. Y.  
Taunton Locomotive Mfg. Co., Taunton, Mass.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coil Pipe Co., Hartford, Ct.  
Drivings Wire Fence Co., Anderson, Ind.  
Ellis & Haltenbarger, Indianapolis, Ind.  
Frost Wire Fence Co., Cleveland, O.  
Gilbert & Bennett Mfg. Co., 43 Cliff St.  
Hartman Mfg. Co., 38 Broadway, N. Y.  
Kilmer Wire Mfg. Co., Chicago, Ill.  
Kokomo Fence Mch. Co., Kokomo, Ind.  
Ludlow Saylor Wire Co., St. Louis, Mo.  
Ornamental Iron & Wire Co., Chattanooga, Tenn.  
Rosenman Woven Wire Fence Co., Rossmore, N. Y.  
Stewart Iron Works, Cincinnati, Ohio.  
Up-to-date Mfg. Co., Terre Haute, Ind.
- Ferro-Chromium**  
Willson Aluminum Co., 90 Cedar Street, N. Y.
- Files and Rasps**  
Manufacturers of  
Arcade File Works, Anderson, Ind.  
Barnett, G. & H. Co., 41 & 43 Richmond Phila.  
Dixon, Henry & Sons, Inc., Phila., Pa.  
Heller Bros. Co., Newark, N. J.  
McCaffrey File Co., Philadelphia.  
Nicholson File Co., Providence, R. I.  
Stokes Bros. Mfg. Co., Freehold, N. J.
- Filters**  
Scaife, Wm. B. & Sons, Pittsburgh, Pa.
- Finished Castings**  
Franklin, H. H. Mfg. Co., Syracuse, N. Y.



**Fire Brick**

Borgner, Cyrus, Philadelphia, Pa.  
Gardner Bros., Cumberland, Md.  
Haw, W. H. Fire Brick Co., Mt. Union,  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Presbrey Fire Brick Co., Taunton, Mass.  
Staten Island Clay Co., Woodbridge,  
Taylor, Chas. Sons Co., Cincinnati.  
Valentine, M. D. & Bro. Co., Woodbridge,

**Fishing Tackle**

Dame, Stoddard & Co., Boston, Mass.

**Flexible Metallic Tubing**

Harris, Samuel & Co., Chicago, Ill.

**Flexible Shafting**

Chicago Flexible Shaft Co., Chicago, I. I.  
Stow Flexible Shaft Co., Phila., Pa.  
Stow Mfg. Co., Binghamton, N. Y.

**Flint and Emery Paper**

Bader, Adamson & Co., Phila., Pa.

**Floor and Ceiling Plates**

Codling Mfg. Co., Bristol, Conn.

**Flue Cleaners**

Jackson Flue Scraper Co., Jackson  
Jarecki Mfg. Co., Erie, Pa.

**Fly Killers**

Bigelow, J. F., Worcester, Mass.

**Foot Power Emery Wheels**

Buffalo Emery Wheel Co., Buffalo, N. Y.

**Foot Pumps**

Gleason-Peters Air Pump Co., Houston  
and Mercer Sta., N. Y.

**Foot Rests**

Star Heel Plate Co., Newark, N. J.

**Forges, Portable, &c.**

Bradley Co., Syracuse, N. Y.  
Champion Blower & Forge Co., Lancaster,  
Pa.

**Forgings, Iron and Steel**

Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.  
Bethlehem Steel Co., S. Bethlehem, Pa.  
Eastern Forge Co., Boston, Mass.  
Frankford Steel Co., Phila., Pa.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Oile Steel Co., Ltd., Cleveland, Ohio.  
Pittsburgh Sheet, Knife & Machine Co.,  
Pittsburgh, Pa.  
Titusville Forge Co., Titusville, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.  
Vulcanus Forging Co., Cleveland, O.

**Forks, Hay and Manure**

Continental Tool Co., Frankfort, N. Y.  
Iowa Farming Tool Co., Ft. Madison, Ia.  
Withington & Cooley Mfg. Co., Jackson.

**Foundry Facings**

Obermayer, S. Co., Cincinnati, O.

**Foundry Lamps**

Forest City Fdy. & Mfg. Co., Cleveland.  
Paxson, J. W. Co., Phila., Pa.

**Foundry Supplies**

Gilmour, J., Bennett Building, N. Y.  
Obermayer, S. Co., Cincinnati, Ohio.  
Osborn Mfg. Co., Cleveland, O.  
Paxson, J. W. Co., Phila., Pa.

**Friction Clutches**

Eastern Machinery Co., New Haven, Ct.

**Friction Chaps**

Perkins Machine Co., Boston, Mass.

**Furnaces, Foundry**

Bryant & Co., Detroit, Mich.

**Furnaces, Oil, Gas and Coal**

Rockwell Engineering Co., 26 Cortlandt  
St., N. Y.

**Fuses**

Ensign Bickford & Co., Simsbury, Ct.

**Gages**

Crosby Steam Gage & Valve Co., Boston.

**Galvanized Ware**

Keen & Hagerty Mfg. Co., Baltimore.

**Galvanizing**

Blackman & King, 801 Greenwich St.,  
N. Y.  
Empire Pipe Bending & Supply Co.,  
Brooklyn, N. Y.

**Galvanizing Process**

U. S. Electro Galvanizing Co., 948 Broad-  
way, N. Y.

**Garden Hakes**

Jenkins Iron & Tool Co., Howard, Pa.

**Garden Tools**

Withington & Cooley Mfg. Co., Jackson.

**Gas Compositometer**

Uehling, Steinbart & Co., Ltd. Carl-  
stadt, N. J.

**Gas Compressors**

Norwalk Iron Works Co., So. Norwalk.

**Gas Furnaces**

Am. Gas Furnace Co., 23 John St., N. Y.  
Chicago Flexible Shaft Co., Chicago, Ill.

**Gaskets**

Canfield, H. O., Bridgeport, Conn.

**Gaskets, Iron**

Smooth On Mfg. Co., Jersey City, N. J.

**Gas Producers**

Duff Patents Co., Allegheny, Pa.  
Smythe, S. R. Co., Inc., Pittsburgh, Pa.  
Swindell, W. & Bro., Pittsburgh, Pa.

**Gauges, Rolling Mill**

Haines Gauge Co., Philadelphia, Pa.

**Gears**

Boston Gear Works, Boston, Mass.  
Cresson, Geo. V. Co., Philadelphia, Pa.  
Gleason Tool Co., Rochester, N. Y.  
Morse, Williams & Co., Phila., Pa.  
Nuttall, R. D. Co., Allegheny, Pa.  
Poole, Robt. Son & Co., Baltimore, Md.

**Gears, Rawlides**

Horsburgh & Scott, Cleveland, Ohio.

**Gear Cutters**

Becker-Brinard Milling Machine Co.,  
Hyde Park, Mass.  
Gould & Eberhardt, Newark, N. J.  
Whitton, D. E. Mch. Co., New London,

**Generators, Electric**

Westinghouse Elec. & Mfg. Co., Pitts-  
burgh, Pa.  
Morton Mfg. Co., Chester, Conn.

**Glass Cutters**

Barrett, W. L., Bristol, Conn.  
Hartman, F. H. & Co., Cleveland, O.

Monce, S. G., Unionville, Conn.  
Smith & Hemenway Co., 295 Broadway,  
N. Y.

**Glass Cutting Boards**

Lufkin Rule Co., Saginaw, Mich.

**Glue**

Bader, Adamson & Co., Phila., Pa.

**Golf Goods**

Bridgeport Gun Implement Co., 312  
Broadway, N. Y.

**Grates, Rocking**

Sennett, Geo. E. Co., Youngstown, O.

**Grease, Axle**

Snow Flake Axle Grease Co., Boston.

**Grinding and Polishing Mchs.**

American Emery Wheel Works, Provi-  
dence, R. I.  
Barnes, W. F. & John Co., Rockford, Ill.  
Brown & Sharpe Mfg. Co., Providence.  
Cincinnati Milling Mach. Co., Cin-  
cinnati, O.

Diamond Mach. Co., Providence, R. I.  
Landis Tool Co., Waynesboro, Pa.  
Northampton Emery Wheel Co., Leeds,  
Mass.

Norton Emery Wheel Co., Worcester,  
Mass.

Safety Emery Wheel Co., Springfield, O.

Springfield Mfg. Co., Bridgeport, Conn.

Star Coprindum Wheel Co., Detroit,  
Mich.

Tanite Co., Stroudsburg, Pa.

Universal Mach. Co., Providence, R. I.

Wilmarth & Norman, Grand Rapids,  
Mich.

Grindstones  
Cleveland Stone Co., Cleveland, O.  
Velox Machine Works, Chicago, Ill.

Grubbing Machine  
New Century Mfg. Co., 48 E. 8th St.,  
N. Y.

Guns  
Marlin Fire Arms Co., New Haven, Ct.  
Remington Arms Co., 315 Broadway,  
New York

Gymnasium Apparatus  
Narragansett Mch. Co., Providence, R. I.

Hack Saws  
Dixson, Henry & Sons, Inc., Phila., Pa.  
Goodell-Pratt Co., Greenfield, Mass.  
Springfield Machine Screw Co., Spring-  
field, Mass.  
Starrett, L. S. Co., Athol, Mass.

Hack Saw Frames  
Millers Falls Co., 28 Warren St., N. Y.

Hammer Mold  
Field, C. H., Providence, R. I.

Hammers  
Heller Bros. Co., Newark, N. J.  
Logan & Strobbridge Iron Co., New  
Brighton, Pa.

Hammers, Pneumatic  
Chicago Pneumatic Tool Co., Chicago.

Hammocks  
Palmer, I. E., Middletown, Conn.  
Bicknell Hdw. Co., Janesville, Wis.

Hand Screws  
Bliss, R. Mfg. Co., Pawtucket, R. I.

Handle Machinery  
Deane Machine Works, Dedans, O.

Hangers, Barn Door  
Coleman Hardware Co., Chicago, Ill.

Hangers, Door  
Chicago Spring Butt Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Hol-  
yoke, Mass.

Cronk Hanger Co., Elmira, N. Y.  
Lane Bros., Poughkeepsie, N. Y.  
Lawrence Bros., Sterling, Ill.  
Louden Machinery Co., Fairfield, Iowa.  
McCabe Hanger Mfg. Co., 539-543 W. 23d  
Street, N. Y.

McKinney Mfg. Co., Allegheny, Pa.  
Ney Mfg. Co., Canton, Ohio.  
Stowell Mfg. & Foundry Co., So. Mil-  
waukee, Wis.

Wilcox Mfg. Co., Aurora, Ill.

Hangers, Shafting  
Hall Bearing Co., Boston, Mass.

Dodge Mfg. Co., Mishawaka, Ind.

Machinists Supply Co., Rochester, N. Y.

Hardware Comm'n Merchants  
Graham, Jno. H. & Co., 113 Chambers  
St., N. Y.

Hungerford, U. T., Brass & Copper Co.,  
121 Worth St., N. Y.

Hardware Manufacturers  
Aroado Mfg. Co., Freeport, Ill.

Central Hardware Co., Phila.

Coleman Hardware Co., Chicago, Ill.

Logan & Strobbridge Iron Co., New  
Brighton, Pa.

Millers Falls Co., 28 Warren St., N. Y.

Ney Mfg. Co., Canton, Ohio.

Nicol & Co., Cincinnati, Ill.

Parker, Chas. Co., Meriden, Conn.

Peck, Stow & Wilcox Co., 27 Murray St.,  
N. Y.

Southington Cutlery Co., Southington,  
Conn.

Stanley Works, New Britain, Conn.

Union Mfg. Co., 103 Chambers St., N. Y.

Van Wagoner & Williams Hdw. Co.,  
Cleveland, O.

Wrightsville Hdw. Co., Wrightsville, Pa.

Hardware Mfrs.' Agents  
Graham, John H. & Co., 113 Chambers  
St., N. Y.

Webusch & Hilger, Ltd., 9-15 Murray  
St., N. Y.

Hardware Shelving  
Warren, J. D. Mfg. Co., Chicago, Ill.

Hardware Specialties  
Acme Shear Co., Bridgeport, Conn.

Berger Bros. Co., Philadelphia, Pa.

Enterprise Mfg. Co., of Pa., Phila., Pa.

Graham, John H. & Co., 113 Chambers  
St., N. Y.

Pleuger & Henger Mfg. Co., St. Louis.

Scranton & Co., The, New Haven, Ct.

Smith & Egge Mfg. Co., Bridgeport, Ct.

Smith & Hemenway Co., 295 Broadway,  
N. Y.

Wilson & Smith, Worcester, Mass.

Harness Snaps  
Covert Mfg. Co., West Troy, N. Y.

Cover's Saddlery Wks., Farmer, N. Y.

Imperial Bit & Snp Co., Racine, Wis.

Haps and Staples  
McKinney Mfg. Co., Allegheny, Pa.

Hatchets  
Jenkins Iron & Tool Co., Howard, Pa.

**Hay Knives**

Clark & Parsons Co., E. Wilton, Ma.  
Ney Mfg. Co., Canton, Ohio.

**Hay Slings**

Goshen Mfg. Co., Goshen, Ind.

**Hay Tools**

Louden Machinery Co., Fairfield, Iowa.  
Myers, F. E. & Bro., Ashland, O.  
Ney Mfg. Co., Canton, O.

**Heating and Ventilating Appa-  
ratus**

American Blower Co., Detroit, Mich.  
Bayley, Wm. & Sons Co., Milwaukee,  
Wis.

Boston Blower Co., Hyde Park, Mass.

Buffalo Forge Co., Buffalo, N. Y.

Perrins, R. F. & Son, Holyoke, Mass.

Sturtevant, B. F. Co., Boston, Mass.

**Heel Plates**

Star Heel Plate Co., Newark, N. J.

**Hinges**

Jenkins Iron & Tool Co., Howard, Pa.  
Lawrence Bros., Sterling, Ill.  
McKinney Mfg. Co., Allegheny, Pa.  
Stanley Works, New Britain, Conn.

Tiebout, W. & J., 118 Chambers St., N. Y.

**Hitching Posts**

Hartman Mfg. Co., 309 Broadway, N. Y.

Hoes, Garden, Planters', &c.  
Continental Tool Co., Frankfort, N. Y.

Iowa Farming Tool Co., Fort Madison.

Jenkins Iron & Tool Co., Howard, Pa.

**Holists, Air**

Pedrick & Ayer Co., Philadelphia, Pa.  
Ridgway, Craig & Son Co., Coatesville,  
Pa.

Holists, Chain and Rope  
Box, Alfred & Co., Philadelphia, Pa.

Eckstein, C. G., 245 Centre St., N. Y.

Fulton Iron & Engine Works, Detroit,  
Mich.

Harrington, E., Son & Co., Phila., Pa.

McCoy, Jos. F. & Co., 26 Warren St.,  
Reading, Pa.

Speidel, J. G., Reading, Pa.

Holisting Machines  
Eastern Machinery Co., New Haven, Ct.

Lidgerwood Mfg. Co., 96 Liberty St.,  
N. Y.

**Hollow Mill**

Geometric Drill Co., Westville, Conn.

**Hollow Ware**

Avery Stamping Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleve-  
land, O.

New York Stamping Co., Brooklyn, N. Y.

Rogers, Jno. M., Boat Gauge & Drill  
Works, Gloucester, City, N. J.

**Horse Nails**

Capewell Horse Nail Co., Hartford, Ct.  
Mooney, W. M. & Co., Auauale Chasm,  
N. Y.

National Horse Nail Co., Vergennes, Vt.

Putnam Nail Co., Neponset, Boston.

Wunsch & Hilger, Ltd., 9-15 Murray  
St., N. Y.

**Horse and Mule Shoes**

Burden Iron Co., Troy, N. Y.  
Phoenix Horse Shoe Co., Poughkeepsie,  
Rhode Island Perkins Horse Shoe Co.,  
Providence, R. I.

**Horsehoe Studs**

Leonhart & Co., Berlin, Schoneberg,  
Germany.

**Hose**

Boston Belting Co., Boston, Mass.  
Peerless Rubber Mfg. Co., 16 Warren  
Street, New York.

**Hose Couplings**

Clark, W. J. & Co., Salem, Ohio.

**Hose Coupling, Air**

Pedrick & Ayer Co., Philadelphia, Pa.

**Hose Washers**

Canfield, H. O., Bridgeport, Conn.

**House Furnishing Specialties**

Williams, A. C., Ravenna, O.

**Hydrants**

Reading Fdy. Co., Reading, Pa.

**Hydraulic Jacks**

Dudgeon, Richard, 24 Columbia St., N. Y.  
Henderer, A. L. Sons, Wilmington, el.  
Watson-Stillman Co., 304 E. 43d St., N. Y.

**Hydraulic Machinery**

Watson-Stillman Co., 304 E. 43d St., N. Y.

**Hydraulic Presses**

Cornell, J. B. & J. M., 36th St. and 11th  
Ave., N. Y.

**Hydraulic Tools**

Watson-Stillman Co., 304 E. 43d St., N. Y.  
Wood, R. D. & Co., Phila., Pa.

**Ice Cream Dishers**

Seavey Mfg. Co., Boston, Mass.

**Ice Cream Freezers**

North Bros. Mfg. Co., Philadelphia, Pa.  
White Mountain Freezer Co., Nashua,  
N. H.

**Ice Making Machinery**

York Mfg. Co., York, Pa.

**Ice Picks**

Dodge Machine Screw Co., Boston, Mass.  
Erie Specialty Co., Erie, Pa.

**Ice Shredders**

Enterprise Mfg. Co., Philadelphia, Pa.  
Erie Specialty Co., Erie, Pa.

**Ice Tools**

Gerlach, Peter & Co., Cleveland, O.  
Williams, A. C., Ravenna, O.  
Wood, Wm. T. Co., Arlington, Mass.

**Injectors**

**Lemon Squeezers**

Hagen & Reid, Troy, N. Y.  
Logan & Strawbridge Iron Co., New Brighton, Pa.  
Williams, A. C., Ravenna, O.

**Link Belt**

Buhl Malleable Co., Detroit, Mich.

**Lockers**

Narragansett Mch. Co., Providence, R.I.

**Locks and Knobs**

Central Hardware Co., Phila., Pa.  
Perkins Open Door Lock Co., Grand Rapids, Mich.  
Reading Hdw. Co., Reading, Pa.  
U. S. Steel Lock Co., Clinton, Iowa.

**Locomotives**

Everson, B. M., Pittsburgh, Pa.

**Logging Tools**

Gerlach, Peter & Co., Cleveland, Ohio.

**Lubricants**

Dixon, Jos., Crucible Co., Jersey City, N. J.  
Snow Flake Axle Grease Co., Boston.

**Lumbering Tools**

Morley Irons, Saginaw, Mich.

**Lunch Boxes**

Seavey Mfg. Co., Boston, Mass.

**Machinery**

Acme Machinery Co., Cleveland, Ohio.  
Ajax Mfg. Co., Cleveland, Ohio.  
American Tool Wks. Co., Cincinnati, O.

Ashcraft, A., 109 Liberty St., N. Y.  
Baird, U. Machinery Co., Pittsburgh, Pa.  
Barnes, W. F. & John Co., Rockford, Ill.

Bush Mch. Tool Co., Springfield, Mass.  
Becker-Brinard Milling Mach. Co., Hyde Park, Mass.

Bliss E. W. Co., Brooklyn, N. Y.  
Bowler, Geo. H., Cleveland, O.

Briggs, Marvin, 12 Broadway, N. Y.  
Brown & Sharpe Mfg. Co., Providence, R.I.

Bullard Mch. Tool Co., Bridgeport, Ct.  
Carlin Machinery & Supply Co., Allegheny, Pa.

Carlin's Sons, Thos., Allegheny, Pa.  
Chesley Machine Co., Havemeyer Bldg., N. Y.

Cincinnati Milling Mach. Co., Cincinnati, O.  
Cincinnati Planer Co., Cincinnati, Ohio.

Cornell, J. B. & J. M., 26th St. and 11th Ave., New York City.

Davis, W. P. Machine Co., Rochester, N. Y.

Dawson, A. L. & Co., Chicago, Ill.  
Detrick & Harvey Mch. Co., Baltimore, Md.

Diamond Drill & Mch. Co., Birdsboro, Pa.

Doan, J. B. & Co., Chicago, Ill.  
Draper Mach. Tool Co., Worcester, Mass.

Farrar & Fyfe & Mch. Co., Ansonia, Conn.  
Ferracute Machine Co., Bridgeport, N. J.

Fish, H. C. Machine Works, Worcester, Mass.

Garvin Machine Co., Spring and Varick Sts., N. Y.

General Supply Co., 40 John St., N. Y.  
Geometric Drill Co., Westville, Conn.

Gray, Robt. J., 634 E. 132d St., N. Y.  
Hagman & Finton, Springfield, Mass.

Hendey Machine Co., Torrington, Conn.  
Hill, Henry F., Boston, Mass.

Hill, Clarke & Co., Boston, Mass.  
Johnson, Israel H., Jr., & Co., Phila.

Johnson, Wm. C. & Sons Mch. Co., St. Louis, Mo.

Kaiser, A. V. & Co., Phila., Pa.  
Keagy & Lear Mch. Co., Cohocton, O.

Kerrick, J. H., Minneapolis, Minn.  
Lodge & Shipley Mch. Tool Co., Cin., O.

Lund, S. T., Boston, Mass.  
McCabe, J. J., 14 Dey Street, N. Y.

McDowell, Stocker & Co., Chicago.  
Manning, Maxwell & Moore, 35-39 Liberty St., N. Y.

Manville, E. J. Mach. Co., Waterbury, Ct.  
Marshall & Buschart Mch. Co., Chicago, Ill.

Mosberg, Frank Co., Attleboro, Mass.  
National Machinery Co., Tiffin, Ohio.

New Duty Mfg. Co., Janesville, Wis.  
New Haven Mfg. Co., New Haven, Conn.

New York Machinery Depot, 175 Broadway, New York.

Niles Tool Wks., 135 Liberty St., N. Y.  
Nilson, A. H. Mch. Co., Bridgeport, Ct.

Paradox Machinery Co., Chicago, Ill.  
Pennsylvania Machinery Co., Phila., Pa.

Phila. Machine Tool Co., Phila., Pa.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.

Pond Machine Tool Co., Plainfield, N. J.  
Pootie, Robt. & Son Co., Baltimore, Md.

Potter & Johnston Co., Pawtucket, R. I.  
Poulter & Co., Phila., Pa.

Pratt & Whitney Co., Hartford, Conn.  
Prentice Bros., Worcester, Mass.

Prentiss Tool & Supply Co., 113 Liberty St., N. Y.

Rainier & Williams, Chicago, Ill.  
Reade, Wm. A. & Co., Cleveland, O.

Seyfert's Sons L. F., Philadelphia, Pa.  
Sigourney Tool Co., Hartford, Conn.

Thomas & Lowe Machinery Co., Providence, R. I.

Toomey, Frank, Philadelphia, Pa.  
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

Weatherill Robert & Co., Chester, Pa.  
Windsor Machine Co., Windsor, Vt.

Wormer, C. C. Mch. Co., Detroit, Mich.  
York, S. M. Co., Cleveland, O.

**Machinery, Wood Working**  
DeLance Machine Wks., DeLance, O.

Fay, J. A. & Egan Co., Cincinnati, O.

**Machinery Springs**  
Scott, Chas. Spring Co., Phila., Pa.

**Machinery Builders**  
Chapman, J. B. & Co., Springfield, Mass.

U. S. Projectile Co., Brooklyn, N. Y.

**Machine Knives**  
Loyd, John, 535-537 Water St., N. Y.

**Machine Screws—See Screws, Machine**

**Machine Screw Work**  
Spencer Automatic Mch. Screw Co., Hartford, Conn.

**Machine Tools—See Machinery**

**Machine Work**  
Nuttall, R. D. Co., Allegheny, Pa.

**Machine Wrenches**  
Billings & Spencer Co., Hartford, Conn.

**Machinists' Scales**  
Starrett, L. R. Co., Athol, Mass.

**Machinists' Tools and Supplies**  
Billings & Spencer Co., Hartford, Conn.

General Supply Co., 40 John St., N. Y.

Harris, Samuel & Co., Chicago, Ill.

Keystone Mfg. Co., Buffalo, N. Y.

King, J. M. & Co., Watford, N. Y.

**Manganese Bronze**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Manufacturing Properties**

Hillman, J. H. & Co., Pittsburgh, Pa.

**Manufacturing Sites**

Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.

Southern Railway Co., Washington, D. C.

**Measuring Machines**

Rogers, Jno. M. Boyl, Gauge & Drill Wks., Gloucester City, N. J.

**Meat Choppers**

Enterprise Mfg. Co. of Pa., Phila., Pa.

Peck, Stow & Wilcox Co., 37 Murray St., New York.

Streeter, N. R. & Co., Rochester, N. Y.

Woodruff, O. D., Pottstown, Pa.

**Metal Brokers**

American Metal Co., 52 Broadway, N. Y.

**Metal Factors**

Stroud, E. H. & Co., Chicago, Ill.

**Metals**

Hendricks Bros., 49 Cliff St., N. Y.

Hofeller, Theo. & Co., Buffalo, N. Y.

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Butter, A. T., 256 Broadway, N. Y.

United Metals Selling Co., 11 Broadway, N. Y.

**Metal Polish**

Hoffman, Geo. W., Indianapolis, Ind.

**Metal Spinning**

Goodwin & Kintz Co., Winsted, Conn.

**Milling Machines**

Adams Co., Dubuque, Iowa.

Becker-Brinard Milling Machine Co., Hyde Park, Mass.

Brown & Sharpe Mfg. Co., Providence, Carter & Hakes Mach. Co., Winsted, Ct.

Cincinnati Milling Mach. Co., Cin., O.

Fox Machine Co., Grand Rapids, Mich.

Garvin Machine Co., Spring and Varick Sts., N. Y.

Niles Tool Works, Hamilton, O.

Rhuster, F. B. Co., New Haven, Conn.

Thurston Mfg. Co., Providence, R. I.

**Mining Knives**

Bishop, Geo. H. & Co., Cincinnati, O.

Palmer Hdw. Mfg. Co., Troy, N. Y.

**Mining Machinery**

Allis, E. P. Co., Milwaukee, Wis.

Rand Drill Co., 100 Broadway, N. Y.

**Mining Screens**

Harrington & King Perforating Co., Chicago, Ill.

Howard & Morse, 45 Fulton St., N. Y.

Michigan Wire Cloth Co., Detroit, Mich.

**Miter Boxes**

Thompson Bros. & Co., Lowell, Mass.

**Molding Machines**

Bishop, Geo. H. & Co., Dubuque, Iowa.

Maywood Fdry. & Mch. Co., Chicago.

**Motor Fans**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Motors, Air**

Stow Flexible Shaft Co., Phila., Pa.

**Motors, Electric**

Eddy Electric Mfg. Co., Windsor, Conn.

General Electric Co., Schenectady, N. Y.

Sturtevant, B. F. Co., Boston, Mass.

Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

**Nail Clippers**

Cook, H. C. Co., Ansonia, Conn.

**Nail Machinery**

Crescent Mfg. Co., Belleville, Ill.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nail Pullers**

Bridgeport Mfg. Co., Bridgeport, Conn.

Hagen & Reid, Troy, N. Y.

Scranton & Co., The, New Haven, Conn.

Snow, L. T., New Haven, Conn.

**Name Plates, Machinery**

Livermore, Homer F., Boston, Mass.

Mordock Parlor Gir. Co., Boston, Mass.

**Natural Gas Pumps**

Norwalk Iron Wks. Co., So. Norwalk, Ct.

**Nickel Platers' Supplies**

Eddy Electric Mfg. Co., Windsor, Conn.

**Nickeloid**

American Nickeloid Co., Peru, Ill.

**Norway Shapes**

Rowland, William & Harvey, Frankford, Philadelphia.

**Nuts—See Bolts**

**Nuts, Self-Locking**

National Elastic Nut Co., Milwaukee, Wis.

**Nut Machines**

Dunham Nut Co., Unionville, Conn.

**Oil Burning Appliances**

Rockwell, Engineering Co., 26 Cortlandt St., N. Y.

**Oil Extractor**

Reed & Curtis Mch. Screw Co., Worcester, Mass.

**Oil Heaters—See Oil Stoves.**

**Oil Stones**

Pike Mfg. Co., Pike Station, N. H.

**Oil Stoves—(See Stoves Oil, Vapor and Gasoline)**

**Oilers**

Gem Mfg. Co., Pittsburgh, Pa.

Hammer & Co., Bradford, Conn.

Schultzburg Mfg. Co., Keithsburg, Ill.

Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Oilless Bearings**

North American Metalline Co., Long Island City, N. Y.

**Ore Breakers**

Aultman Co., Canton, O.

Cresson, Geo. V. Co., Phila., Pa.

**Ores**

Blair, Reed F. Co., Pittsburgh, Pa.

Samuel, Frank, Philadelphia, Pa.

Water, Francis, Philadelphia, Pa.

**Ox Shoes**

Scranton Forging Co., Scranton, Pa.

Woodruff, Walter W. & Sons, Mt. Carmel, Conn.

**Packing**

Boston Belting Co., Boston, Mass.

Morrison, Robert, St. Louis, Mo.

Peerless Rubber Mfg. Co., 16 Warren Street, N. Y.

**Packing, Iron**

Smooth On Mfg. Co., Jersey City, N. J.

**Paints**

Dixon, Jos., Crucible Co., Jersey City, N. Y.

**Pants Stretcher**

Covert Mfg. Co., West Troy, N. Y.

**Patent Solicitors**

Goepel & Kaegeher, 230 Broadway, N. Y.

Hamlin, Geo. R., Washington, D. C.

Howson & Howson, Philadelphia and Washington.

Stocking, E. B., Washington, D. C.

**Perforated Metal**

Clinton Wire Cloth Co., Clinton, Mass.

Harrington & King Perforating Co., Chicago, Ill.

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Phosphor Bronze**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Phosphor Bronze Smelting Co., Limited, Philadelphia.

**Phosphor Tin**

Crescent Phosphorized Metal Co., Philadelphia, Pa.

Halk & Naumann, 513 Pearl St., N. Y.

**Plane Plate Manufacturers**

Randolph Iron Co., Brooklyn, N. Y.

**Picture Wire**

Oswann Mills Co., Norwich, Conn.

**Pig Casting Machines**

Heyl & Patterson, Pittsburgh, Pa.

**Pig Iron**

Alabama Consolidated Coal & Iron Co., Birmingham, Ala.

Ashland Steel Co., Ashland, Ky.

Baird, C. B. & Co., Phila., Pa.

Cherry Valley Iron Co., Pittsburgh, Pa.

Dimmick, J. K. & Co., Phila., Pa.

Hickman, Williams & Co., Chicago, Ill.

Houston, C. B. & Co., Philadelphia, Pa.

Nicoll, B. & Co., 35-37 Wall St., N. Y.

Samuel, Frank, Philadelphia, Pa.

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

Snyder, W. P. & Co., Pittsburgh, Pa.

Superior Charcoal Iron Co., Grand Rapids, Mich.

Tennessie Coal, Iron & R. R. Co., Birmingham, Ala.

Tidewater Steel Co., Phila., Pa.

Virginia Iron, Coal and Coke Co., Bristol, Va.—Tenn.

**Pig Iron Storage**

Am. Pig Iron Storage Warehouse Co., 4 Wall St., N. Y.

**Pig Lead**

Penna. Smelting Co., Pittsburgh, Pa.

**Pile Drivers**

Volcan Iron Works, Chicago, Ill.

**Pipe, Bent**

National Pipe Bending Co., New Haven, Conn.

**Pipe Coupling**

Williams, J. H. & Co., Brooklyn, N. Y.

**Pipe Cutting and Threading Machines**

Armstrong Mfg. Co., Bridgeport, Conn.

Signal & Keeler Mfg. Co., Edwardsville, Ill.

Curtis & Curtis, Bridgeport, Conn.

Jarecki Mfg. Co., Erie, Pa.

Merrill Mfg. Co., Toledo, O.

Saunders' Sons, D., Yonkers, N. Y.

**Pipe Grips**

Prentiss Vise Co., 44 Barclay, N. Y.

**Pipes, Fittings, &c.**

Jarecki Mfg. Co., Erie, Pa.

McNab & Harlin Mfg. Co., N. Y.

**Pipe, Riveted Steel**

Pollock, W. R. Co., Youngstown, O.

Scaife,



**Refrigerators**

Maine Mfg. Co., Nashua, N. H.  
Wilke Mfg. Co., Anderson, Ind.

**Registers**

Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

**Relaying Rails**

Donaldson & Newton, Phila., Pa.  
Isaac Joseph Iron Co., Cincinnati, O.  
May & Spalding, 32 Broadway, N. Y.  
Steel Rail Supply Co., 100 Broadway, N. Y.

**Relanding Tools**

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Ideal Mfg. Co., New Haven, Conn.

**Repairing Sets, Family**

Mitchell, W. R., Chicago, Ill.  
Star Heel Plate Co., Newark, N. J.

**Repair Outfits, Farmers'**

Imperial Bit & Snap Co., Racine, Wis.

**Revolution Counters**

Pitkin, A. B., Machry. Co., Providence, R. I.  
Tabor Mfg. Co., Elizabeth, N. J.

**Revolvers**

Harrington & Richardson Arms Co., Worcester, Mass.  
Johnson, Iver, Arms & Cycle Works, Fitchburg, Mass.

**Rheostats**

Electric Controller & Supply Co., Cleveland, O.

**Rifles**

Marlin Fire Arms Co., New Haven, Ct.  
Remington Arms Co., 315 Broadway, N. Y.  
Stevens Arms & Tool Co., Chicopee Falls, Mass.

**Ring Rollers**

Shuster, F. B. Co., New Haven, Conn.

**Riveters**

Phila. Pneumatic Tool Co., Phila., Pa.

**Riveters, Pneumatic**  
Chicago Pneumatic Tool Co., Chicago, Ill.

**Rivets**

American Iron & Steel Mfg. Co., Lebanon, Pa.  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Burden Iron Co., Troy, N. Y.  
Clark & Cowles, Plainville, Conn.  
Cobb & Drew, Plymouth, Mass.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
McInnes, C. E. & Co., Phila., Pa.  
Plymouth Mills, Plymouth, Mass.  
Rockford Bolt Works, Rockford, Ill.  
Townsend C. O. & E. P., New Brighton, Pa.

**Riveting Machines**

Bethlehem Foundry & Mch. Co., So. Bethlehem, Pa.  
Shuster, F. B. Co., New Haven, Conn.

**Rod Mill Machinery**

Bradock Machine & Mfg. Co., Bradock, Pa.  
Morgan Construction Co., Worcester, Mass.

**Roll Turning Tools**

Trethewey, Sam'l & Co., Ltd., Pittsburgh

**Roller Bearings**

Gall Bearing Co., Boston, Mass.  
Mossberg & Granville Mfg. Co., Providence, R. I.

**Rolling Mill Machinery**

Booth, The Lloyd Co., Youngstown, O.  
Evenson, B. M., Pittsburgh, Pa.  
Farrell Fdry. & Mch. Co., Ansonia, Ct.  
Frank-Kneeland Mch. Co., Pittsburgh.  
Garrison, A. Foundry Co., Pittsburgh.  
Mesta Machine Co., Pittsburgh, Pa.  
Morgan Construction Co., Worcester, Mass.  
Mossberg & Granville Mfg. Co., Providence, R. I.  
Penns. Engineering Wks., New Castle, Penna.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel**

Booth, The Lloyd Co., Youngstown, O.  
Farrell Fdry. & Mch. Co., Ansonia, Ct.  
Frank-Kneeland Mch. Co., Pittsburgh.  
Garrison, A. Foundry Co., Pittsburgh.  
Mesta Machine Co., Pittsburgh, Pa.  
Phila. Roll & Mch. Co., Philadelphia, Pa.  
Seaman, Bleeth Co., Pittsburgh.  
Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.  
Youngstown Foundry & Machine Co., Youngstown, O.

**Roofing and Siding**

Asphalt Ready Roofing Co., 136 Water St., N. Y.  
Garry Iron & Steel Roofing Co., Cleveland, O.  
Scaife, Wm. B. & Sons, Pittsburgh  
Youngstown Iron & Steel Roofing Co., Youngstown, O.

**Rope and Cordage**

American Rg. Co., 65 Wall St., N. Y.  
Waterbury Rope Co., 69 South St., N. Y.

**Rope and Web Goods**

Covert Mfg. Co., West Troy, N. Y.

**Rope Shield**

Ironclad Co., Columbus, Ohio.

**Rope Transmission and Hoisting**  
American Rg. Co., 65 Wall St., N. Y.  
California Wire Works, San Francisco, Cal.

**Rope and Wire**

Hunt, C. W. Co., West New Brighton, N. Y.  
Leschen, A. & Sons, Rope Co., St. Louis.  
Wood, I. B. Sons Chambersburg, Pa.

**Rubber Goods**

Boston Belting Co., Boston, Mass.  
Canfield, H. O., Bridgeport, Conn.  
Peerless Rubber Mfg. Co., 16 Warren Street, N. Y.

**Rules**

Larkin Rule Co., Saginaw, Mich.  
Stanley Rule & Level Co., 29 Chambers St., N. Y.

**Sad Irons**

Williams, A. C., Ravenna, O.

**Sad Iron Handles**

Schrayers, M. Sons & Co., Chicago, Ill.

**Sand Blast Apparatus**

Ward, Edgar T. & Sons, Boston, Mass.

**Sand Paper**

Baeder, Adamson & Co., Phila., Pa.  
Grauman, Jno. H. & Co., 113 Chambers St., N. Y.

**Sash Balances**

Caldwell Mfg. Co., Rochester, N. Y.  
Pullman Sash Balance Co., Rochester, N. Y.

Streeter, N. R. & Co., Rochester, N. Y.

**Sash Cords and Chains**

Bridgeport Chain Co., Bridgeport, Conn.  
Morton, Thos., 65 Elizabeth, N. Y.

Samson Cordage Works, Boston, Mass.  
Silver Lake Co., Boston, Mass.  
Smith & Egge Mfg. Co., Bridgeport.

**Sash Locks**

Fitch, W. & E. T. Co., The, New Haven, Conn.

Ives, H. B. & Co., New Haven, Conn.  
Oedinger, J. L., Chicago, Ill.

**Sash Pulleys**

Fox Machine Co., Grand Rapids, Mich.  
Grand Rapids Hardware Co., Grand Rapids, Mich.

Penners Hardware Mfg. Co., Troy, N. Y.

**Sash Weights**

Barney & Reed Mfg. Co., Boston, Mass.  
Brown, E. E. & Co., Philadelphia, Pa.

**Sausage Stuffers**

National Specialty Mfg. Co., Phila., Pa.

**Saws**

Atkins, E. C. & Co., Indianapolis, Ind.  
Bishop, Geo. H. & Co., Cincinnati, Ohio.

Disston, Henry & Sons, Inc., Phila., Pa.  
National Saw Co., Newark, N. J.

Simonds Mfg. Co., Fitchburg, Mass.

**Saw Clamps**

Gunn & Hannah, Pittsburgh, Pa.

**Saw Guides**

Thomson Bros. & Co., Lowell, Mass.

**Saw Handles**

Ladd, W. C., Bristol, Conn.

**Saw Sets**

Disston, Henry & Sons, Inc., Phila., Pa.  
Taintor Mfg. Co., 9 to 15 Murray, N. Y.

**Saw Tools**

Atkins, E. C. & Co., Indianapolis, Ind.

**Scales**

Castillon, John & Sons, 85-89 Cliff, N. Y.  
Chicago Scale Co., Chicago, Ill.

Pelouse Scale & Mfg. Co., Chicago, Ill.  
Reading Hardware Co., Reading, Pa.

Standard Scale & Supply Co., Pittsburgh.

**Scrap Metals**

Armstrong, R. S. & Bro., Atlanta, Ga.  
Blake, M. J. & M., 10th Ave. and 15th St., N. Y.

Botter, C., Hoboken, N. J.  
Greiner, F., Philadelphia, Pa.

Hitner, H. A. & Sons, Phila., Pa.  
Hoffeller, Theo. & Co., Buffalo, N. Y.

Leonard, John & Co., 22 Broadway, N. Y.  
Miles, E. O. & Co., Atlan. a. Ga.

N. J. Iron & Metal Co., Paterson, N. J.  
Perry, Wm. H. Co., Providence, R. I.

Phillips, F. R. & Sons Co., Phila., Pa.  
Rogers, W. H., Bridgeport, Conn.

Samuels, M. Sons, Brooklyn, N. Y.  
Smith Morton B. Co., New York.

**Scrapers, Road**

American Steel Scraper Co., Sidney, O.  
Autman Co., Canton, Ohio.

Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.  
Sidney Steel Scraper Co., Sidney, O.

Syracuse Chilled Plow Co., Syracuse.

**Screen Haulers**

Winter, H. C., Minneapolis, Minn.

**Screens, Perforated Metal**

Harrington & King, Perforating Co., Chicago, Ill.

**Screens, Window and Door**

Dancy, Edw. & Sons, Philadelphia, Pa.

**Screw Cutting Dies**

Card, S. W. Mfg. Co., Mansfield, Mass.

Geometric Drill Co., Westville, Conn.  
Rogers, Jno. M. Boat Gauge & Drill Wks., Gloucester City, N. J.

Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Screw Drivers**

Brown, R. H. & Co., New Haven, Conn.  
Goodell-Fratt Co., Greenfield, Mass.

Mayhew, H. H. Co., Shelburne Falls, Mass.  
North Bros. Mfg. Co., Philadelphia, Pa.

Sawyer Tool Co., Fitchburg, Mass.  
Union Mfg. Co., Buffalo, N. Y.

**Screw Machinery**

American Tool Wks. Co., Cincinnati, O.  
Brown & Sharpe Mfg. Co., Providence.

Draper Mach. Tool Co., Worcester, Mass.  
Garvin Machine Co., Springfield, Vt.

Jones & Lamson Mch. Co., Springfield, Vt.  
Windsor Mch. Co., Windsor, Vt.

**Screws**

Hall's Sam'l Sons, 229 West 10th St., N. Y.  
Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

**Machine**

American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.

Chicago Screw Co., Chicago, Ill.  
Haskell, Wm. H. Mfg. Co., Pawtucket, Conn.  
Hubbell, Harvey, Bridgeport, Conn.  
Illinois Screw Co., Chicago, Ill.  
Miles, F. S., 305 Quarry, Philadelphia, Pa.  
Niagara Screw Co., Buffalo, N. Y.  
Phila. Mach. Screw Works, Phila., Pa.  
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.

Reed & Curtis Mch. Screw Co., Worcester, Mass.  
Rhode Island Tool Co., Providence, R. I.  
Southington Cutlery Co., Southington, Conn.  
Worcester Mch. Screw Co., Worcester.

Wood  
American Screw Co., Providence, R. I.  
Franklin Moore Co., Winsted, Conn.  
Reading Screw Co., Norristown, Pa.  
Southington Cutlery Co., Southington, Conn.

**Scroll Saws**  
Barnes, W. F. & John Co., Rockford, Ill.

**Scythe Stones and Whetstones**  
Cleveland Stone Co., Cleveland, O.  
Pike Mfg. Co., Pike Station, N. H.

**Seamless Steel Tubes**  
Ivins, Ellwood, 487 Broadway, N. Y.  
Janney, Steinmetz & Co., Phila., Pa.  
National Tube Co., Pittsburgh, Pa.

**Sewing Machines**  
National Sewing Machine Co., Belvidere, Ill.

**Shafting**  
American Steel & Wire Co., Chicago, Ill.  
Cresson, Geo. V. Co., Philadelphia, Pa.

Dodge Mfg. Co., Mishawaka, Ind.  
Fairmount Mch. Co., Philadelphia, Pa.

Finished Steel Co., Youngstown, O.  
Jones & Laughlins Co., Pittsburgh, Pa.

Pardee & Sons, Perth Amboy, N. J.  
Pittsburgh Steel Shafting Co., Rankin, Pa.

Steel Mfg. Co., Binghamton, N. Y.  
Woods, T. B. Sons, Chambersburg, Pa.

**Shaped Iron and Steel**  
Allentown Rolling Mill, Allentown, Pa.  
American Steel Hoop Co., Pittsburgh, Pa.

Forest City Steel & Iron Co., Cleveland, Pa.  
Lindsay, W. W. & Co., Phila., Pa.

Lockhart Iron & Steel Co., Pittsburgh, Pa.  
National Steel Co., Bridgeport, O.

Passaic Rolling Mill Co., Paterson, N. J.  
Phoenix Iron Co., Phila., Pa.

Pittsburgh Steel Shafting Co., Rankin, Pa.  
Republic Iron & Steel Co., Chicago, Ill.

Roberts, A. & P. & Co., Phila., Pa.

**Shapers**  
Barker-Chard Mach. Tool Co., Cincinnati, O.

Gould & Eberhardt, Newark, N. J.  
Potter & Johnston Co., Pawtucket, R. I.

**Shear Knives**  
Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.

Trethewey, Sam'l & Co., Ltd., Pittsburgh

**Shears and Scissors**  
Acme Shear Co., Bridgeport, Conn.

Cattaraugus Cutlery Co., Little Valley, Pa.

Heinrich, R. Sons Co., Newark, N. J.  
Lanc. Cutlery Works, Cedar Rapids, Ia.

National Cutlery Co., Phila., Pa.  
Wielbusch & Hilger, Ltd., 9-15 Murray St., N. Y.

**Shears, Metal**  
Carlin's, Thomas Sons Co., Allegheny.

**Sheet Bars**  
National Steel Co., Battery Park Building, N. Y.

**Sheet and Bolt Copper**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Sheet and Rolled Brass**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Sheet Metal Machinery**  
Adriance Mach. Works, Brooklyn, N. Y.

**Sheets, Galvanized**  
American Sheet Steel Co., New York.

McCullough Iron Co., Wilmington, Del.

**Sheets, Iron and Steel**  
American Sheet Steel Co., New York.

McCullough Iron Co., Wilmington, Del.  
National Steel Co., Bridgeport, O.

Republic Iron & Steel Co., Chicago, Ill.  
Singer, Nimick & Co., Inc., Philadelphia, Pa.

Water, L. & R. Co., Philadelphia, Pa.  
Alan Wood Co., Philadelphia.

**Sheet Zinc**  
Illinois Zinc Co., Peru, Ill.

Mathiesens & Hegeler Zinc Co., La Salle, Ill.

**Shelf Boxes**  
Heller Box Co., Montclair, N. J.

Moore, C. P., Ravenswood, W. Va.

**Shelf Ladders**  
Bicycle Step Ladder Co., Chicago, Ill.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Millbradt, G. A. & Co., St. Louis, Mo.

Mathiesens & Hegeler Zinc Co., La Salle, Ill.

**Shovel, Spades and Scoops**  
St. Louis Shovel Co., St. Louis, Mo.

**Shovels**  
Kilbourne & Jacobs Mfg. Co., Columbus, O.

**Skates, Ice**  
Dame, Stoddard & Co., Boston, Mass.

Union Hardware Co., Torrington, Conn.

**Skate Sharpeners**  
Osborn Mfg. Co., Cleveland, O.

**Skylights**  
Droue, G. Co., Bridgeport, Conn.

**Slaw Cutters**  
Disston, Henry & Sons, Inc., Phila., Pa.

**Smelting Works**  
Leaves, Paul S., 760 S. Broad, Phila.

**Soapstone Goods**  
Pike Mfg. Co., Pike Station, N. H.

**Soapstone Pencils**  
Steward, D. A. Mfg. Co., Chattanooga, Tenn.

**Soldering Copper Handles**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Soldering Coppers**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Speaking Tubes**  
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

**Specialty Manufacturers**  
Franklin, H. Mfg. Co., Syracuse, N. Y.

Smith & Egge Mfg. Co., Bridgeport, Ct.

**Spelter**  
Illinois Zinc Co., Peru, Ill.

Mathiesens & Hegeler Zinc Co., La Salle, Ill.

Penns. Smelting Co., Pittsburgh, Pa.

**Spelter Solder**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Solkes**

American Iron & Steel Mfg. Co., Lebanon, Pa.

**Spoons and Forks**

International Silver Co., Meriden, Ct.

**Sporting Goods**

Dame, Stoddard & Co., Boston, Mass.

**Spray Pumps—(See Pumps)****Springs**

American Steel & Wire Co., Chicago, Ill.  
Barnes, Wallace Co., Bristol, Conn.

Cary Spring Works, 240 W. 29th St., N. Y.  
Chatillon, John & Sons, 85-89 Cliff St., New York.

Clark & Cowles, Plainville, Conn.  
Dunbar Bros., Bristol, Conn.

Miller & Van Winkle, Brooklyn, N. Y.  
Morgan Spring Co., Worcester, Mass.

Sabin Machine Co., Montpelier, Vt.  
Scott, Chas. Spring Co., Phila., Pa.

St. Johns Spring Co., St. Johns, Mich.  
Welch, T. F. Mfg. Co., Boston, Mass.

**Springs, Wagon, Etc.**

Wurster, F. W. & Co., Brooklyn, N. Y.

**Spring Cutters**

Brooks, M. S. & Sons, Chester, Conn.  
Holinger Fence Co., Greenville, O.

**Spring Hinges**

Bommer Bros., Brooklyn, N. Y.  
Chicago Spring Butt Co., Chicago, Ill.

**La Belle Steel Co.**, Pittsburgh, Pa.  
**Lorain Steel Co.**, Lorain, Ohio.  
**Lukens Iron & Steel Co.**, Coatesville, Pa.  
**Nash, Geo. & Co.**, Chicago.  
**National Steel Co.**, Battery Park Building, N. Y.  
**Newkirk, J. B. & Co.**, Philadelphia, Pa.  
**Otis Steel Co., Ltd.**, Cleveland, Ohio.  
**Republic Iron & Steel Co.**, Chicago, Ill.  
**Rowland, Wm. & Harvey**, Frankford, Philadelphia.  
**Singer, Nimick & Co., Inc.**, Pittsburgh.  
**Tidewater Steel Co.**, Phila., Pa.  
**Wardlow, S. & C.**, Sheffield, England.  
**Wilmot & Hobbs Mfg. Co.**, Bridgeport, Conn.  
**Manufacturers' Agents**  
**Ordan & Wallace**, 577-583 Greenwich St., New York.  
**Snyder, W. P. & Co.**, Pittsburgh, Pa.  
**Tennessee Coal, Iron & R. R. Co.**, Birmingham, Ala.  
**Virginia Iron, Coal and Coke Co.**, Bristol, Va.—Tenn.  
**Steel, Self Hardening**  
**Honman & Davis**, 85-87 John St., N. Y.  
**Steel Rails**  
**Lorain Steel Co.**, Lorain, Ohio.  
**Steel Stamps and Stencil Dies**  
**Eucker, L. A.**, Stamp Wks., Little Ferry, N. J.  
**Nash, Geo. M., Jr.**, 61 Fulton St., N. Y.  
**Schwerdtle & Siebert**, Bridgeport, Conn.  
**Steel, Tool**  
**Braeburn Steel Co.**, Braeburn, Pa.  
**Crescent Steel Co.**, Pittsburgh, Pa.  
**Denman & Davis**, 85-87 John St., N. Y.  
**Frankford Steel Co.**, Philadelphia, Pa.  
**Jessop, Wm. & Sons**, Sheffield, England.  
**91 John St., N. Y.**  
**Jones, B. M. & Co.**, Boston, Mass.  
**La Belle Steel Co.**, Pittsburgh, Pa.  
**Nash, Geo. & Co.**, Chicago.  
**Singer, Nimick & Co.**, Pittsburgh, Pa.  
**Step Ladders, Rolling**  
**Bicycle Step Ladder Co.**, Chicago, Ill.  
**Coburn Trolley Track Mfg. Co.**, Holvake, Mass.  
**Millbradt, G. A. & Co.**, St. Louis, Mo.  
**Morley Bros.**, Saginaw, Mich.  
**Portland Ladder Co.**, Newark, N. J.  
**Stocks and Dies**  
**Armstrong Mfg. Co.**, Bridgeport, Conn.  
**Card, S. W. Mfg. Co.**, Mansfield, Mass.  
**Curtis & Curtis**, Bridgeport, Conn.  
**Fairbanks Co.**, 311 Broadway, N. Y.  
**Holland Mfg. Co.**, Erie, Pa.  
**Jones & Lamson Mch. Co.**, Springfield, Vt.  
**Jarecki Mfg. Co.**, Erie, Pa.  
**Saunders' Sons**, D., Yonkers, N. Y.  
**Wells Bros. & Co.**, Greenfield, Mass.  
**Wilder & Russell Mfg. Co.**, Greenfield, Mass.  
**Winter Bros.**, Wrentham, Mass.  
**Stone Cutting Machinery**  
**Gilmour, J. Bennett Bld'g.**, N. Y.  
**Stone Working Machinery**  
**Patch, F. B. Mfg. Co.**, Rutland, Vt.  
**Stop Screws**  
**Head, A. F. & Co.**, Chicago, Ill.  
**Store Fixtures**  
**Warren, J. M. Mfg. Co.**, Chicago, Ill.  
**Storm Sash Hanger**  
**Winter, R. G.**, Minneapolis, Minn.  
**Steve Linings**  
**Ostrander Fire Brick Co.**, Troy, N. Y.  
**Stove Pipe Thimbles**  
**Cheney, S. & Son**, Manlius, N. Y.  
**Stoves, Oil, Vapor and Gasoline**  
**Schneider & Trenkamp Co.**, Cleveland, Ohio.  
**Straightening Machines, Wire and Sheet Metal**  
**Shuster, F. B. Co.**, New Haven, Conn.  
**Structural Iron and Steel Work**  
**Berlin Iron Bridge Co.**, E. Berlin, Conn.  
**Boston Bridge Works**, Boston, Mass.  
**Eatern Bridge & Structural Co.**, Worcester, Mass.  
**Forest City Steel & Iron Co.**, Cleveland, Ohio.  
**Illinois Steel Co.**, Chicago, Ill.  
**Moseley Iron Bridge & Roof Co.**, 30 Cortland St., N. Y.  
**New England Structural Co.**, Boston, Mass.  
**Phoenix Iron Co.**, Philadelphia, Pa.  
**Ritter-Conley Mfg. Co.**, Pittsburgh, Pa.  
**Shaffer Bridge Co.**, Pittsburgh, Pa.  
**Stewart Iron Works**, Cincinnati, Ohio.  
**West Side Foundry Co.**, Troy, N. Y.  
**Structural Tubing**  
**Stetler-Bischoff Co.**, Chicago, Ill.  
**Sulphuric Acid**  
**Mathieson & Co.**, Zinc Co., La Salle, Ill.  
**Swaging Machines**  
**Excelstor Needle Co.**, Torrington, Ct.  
**Table Ware**  
**International Silver Co.**, Meriden, Ct.  
**Tacks, Brads, &c.**  
**Diamond Tack & Nail Works**, Raynham, Mass.  
**Grand Crossing Tack Co.**, Grand Crossing, Ill.  
**Milwaukee Tack Co.**, Milwaukee, Wis.  
**Plymouth Mills**, Plymouth, Mass.  
**Hupley & Bartlett**, Plymouth, Mass.  
**Shelton Co.**, Birmingham, Conn.  
**Tack and Nail Machinery**  
**Kimball Bros. & Sprague**, Brockton, Mass.  
**Perkins, Henry**, Bridgewater, Mass.  
**Sweetzer, W. A.**, Brockton, Mass.  
**Tanks, Iron and Steel**  
**Manogue-Pigeon Iron Co.**, Memphis, Tenn.  
**Scaife, Wm. B. & Sons**, Pittsburgh.  
**Tapes**  
**Lufkin Rule Co.**, Saginaw, Mich.  
**Tap Holder**  
**Ideal Machine Works**, Hartford, Conn.  
**Tapping Machines**  
**Hobell, Harvey**, Bridgeport, Conn.  
**Taps and Dies**  
**Bentley, C. H. & Co.**, Chicago, Ill.  
**Butterfield & J.**, Derby Line, Vt.  
**Card, S. W. Mfg. Co.**, Mansfield, Mass.  
**Reece, E. F. Co.**, Greenfield, Mass.  
**Wells Bros. & Co.**, Greenfield, Mass.  
**Wilder & Russell Mfg. Co.**, Greenfield, Mass.  
**Winter Bros.**, Wrentham, Mass.

**Telephones**  
**Mianus Electric Co.**, Mianus, Conn.  
**Rawson Electric Co.**, Elyria, Ohio.  
**Terne Plate**  
**American Tin Plate Co.**, N. Y.  
**Time Recorders**  
**Chicago Time Register Co.**, Chicago, Ill.  
**Nanz, C. & Co.**, 127 Duane St., N. Y.  
**Simplex Time Recorder Co.**, Gardner, Mass.  
**Wagoner Watchman Clock Co.**, Grand Rapids, Mich.  
**Tin Mills**  
**Philadelphia Roll & Mch. Co.**, Phila., Pa.  
**Phillips, F. B. & Sons Co.**, Phila., Pa.  
**Tinners' Tools and Machines**  
**Niagara Machine & Tool Works**, Buffalo, N. Y.  
**Tin Plate**  
**American Tin Plate Co.**, N. Y.  
**Champion Iron & Steel Co.**, Muskegon, Mich.  
**Merchant & Co., Inc.**, Philadelphia, Pa.  
**Tin Plate Machinery**  
**Lloyd Booth Co.**, Youngstown, Ohio.  
**Tinware**  
**Keen & Hagerity**, Baltimore, Md.  
**Tinware Machinery**  
**Shuster, F. B. Co.**, New Haven, Conn.  
**Tobin Bronze**  
**Ansonia Brass & Copper Co.**, 99 John St., N. Y.  
**Toe Calks, Steel**  
**Burke, F. F.**, Boston, Mass.  
**Toe Clips**  
**Snow, L. T.**, New Haven, Conn.  
**Tool Chests**  
**Am. Tool Chest Co.**, 200 W. Houston St., New York.  
**Bliss, R. Mfg. Co.**, Fawcett, R. I.  
**Tool Grinders**  
**Seiers, Wm. & Co., Inc.**, Phila., Pa.  
**Union Mfg. Co.**, Buffalo, N. Y.  
**Tools**  
**Athol Machine Co.**, Athol, Mass.  
**Braunsdorf-Mueller Co.**, Elizabeth, N. J.  
**Brown, R. H. & Co.**, New Haven, Conn.  
**Goodell Pratt Co.**, Greenfield, Mass.  
**Mayhew, H. H. Co.**, Shelburne Falls, Mass.  
**Millers Falls Co.**, 28 Warren St., N. Y.  
**Springfield Machine Screw Co.**, Springfield, Mass.  
**Stanley Rule & Level Co.**, 29 Chambers St., New York.  
**Starrett, L. S. Co.**, Athol, Mass.  
**Stevens, J.**, Arms & Tool Co., Chicopee, Mass.  
**Tools, Blacksmith and Wheelwright**  
**Champion Blower & Forge Co.**, Lancaster, Pa.  
**Wiley & Russell Mfg. Co.**, Greenfield, Mass.  
**Tools, Steam and Gas Fitters'**  
**Saunders' Sons**, D., Yonkers, N. Y.  
**Torches, Oil and Gasoline**  
**Schneider & Trenkamp Co.**, Cleveland, Ohio.  
**Tool Boxes**  
**Clark, W. J. & Co.**, Salem, O.  
**Toys, Iron**  
**Coleman Hardware Co.**, Chicago, Ill.  
**Transom Openers**  
**Ormsby, E. A.**, Melrose, Mass.  
**Tree Guard**  
**Hartman Mfg. Co.**, 309 Broadway, N. Y.  
**Up-to-date Mfg. Co.**, Terre Haute, Ind.  
**Trolleys**  
**Box, Alfred & Co.**, Philadelphia, Pa.  
**Trowels**  
**Bishop, Geo. H. & Co.**, Cincinnati, O.  
**National Saw Co.**, Newark, N. J.  
**Trucks**  
**Boston & Lockport Block Co.**, Lockport, Mass.  
**Fairbanks Co.**, 311 Broadway, N. Y.  
**Kilbourne & Jacobs Mfg. Co.**, Columbus, Lauding Wheelbarrow Co., Lansing, Mich.  
**Syracuse Chilled Plow Co.**, Syracuse, N. Y.  
**Tub Hoops**  
**Oatman Bros.**, Medina, Ohio.  
**Tube Expanders**  
**Henderer, J. L. & Sons**, Wilmington, Del.  
**Tubes, Seamless Drawn Copper, Brass and Bronze**  
**Hungerford, U. T.**, Brass & Copper Co., 121 Worth St., N. Y.  
**Randolph-Cloves Co.**, Waterbury, Conn.  
**Tubing, Brass**  
**Hungerford, U. T.**, Brass & Copper Co., 121 Worth St., N. Y.  
**Ivins, Ellwood**, 487 Broadway, N. Y.  
**Phoenix Tube Co.**, Brooklyn, N. Y.  
**Spofford, W. S. & Son**, Providence, R. I.  
**Tubing, Iron**  
**Phoenix Tube Co.**, Brooklyn, N. Y.  
**Tubing, Seamless**  
**Ivins Ellwood**, 487 Broadway, N. Y.  
**Tubing, Steel**  
**Heat Transmission Co.**, Danbury, Ct.  
**Hecker-Baltzley Mfg. Co.**, Toledo, O.  
**Ivins, Ellwood**, 487 Broadway, N. Y.  
**Janney, Steinmetz & Co.**, Phila., Pa.  
**Leng's John S. & Co.**, 4 Fletcher St., M'Innes, C. E. & Co., Phila., Pa.  
**National Tube Co.**, Pittsburgh, Pa.  
**Shelby Steel Tube Co.**, Cleveland, O.  
**Stetler-Bischoff Co.**, Chicago, Ill.  
**Wilmot & Hobbs Mfg. Co.**, Bridgeport, Conn.  
**Tumbling Barrels**  
**Henderson Bros.**, Waterbury, Conn.  
**Northern Engineering Works**, Detroit, Mich.  
**Turnbuckles**  
**Cleveland City Forge & Iron Co.**, Cleveland, O.  
**McNeill Bros.**, 465 Kent Ave., Brooklyn, N. Y.  
**Twist Drills**  
**Cleveland Twist Drill Co.**, Cleveland, N. Y.  
**Graham, John H. & Co.**, 113 Chambers St., N. Y.  
**Morse Twist Drill & Machine Co.**, New Bedford, Mass.

**New Process Twist Drill Co.**, Taunton, Mass.  
**Sleehomb, J. T. & Co.**, Providence, R. I.  
**Standard Tool Co.**, Cleveland, O.  
**Twist Drill Grinders**  
**Heald, L. S. & Son**, Barre, Mass.  
**Washburn Shops of Worcester Polytechnic Inst.**, Worcester, Mass.  
**Wilmarth & Morman**, Grand Rapids, Mich.  
**Upholsterers' Hardware**  
**Hungerford, U. T.**, Brass & Copper Co., 121 Worth St., N. Y.  
**Valves, Gas, Water and Steam**  
**Ashon Valve Co.**, Boston, Mass.  
**Chapman Valve Mfg. Co.**, Boston.  
**Crosby Steam Gate & Valve Co.**, Boston.  
**Jenkins Bros.**, 71 John, N. Y.  
**Kennedy Valve Mfg. Co.**, 73 John St., N. Y.  
**McNulty & Harlin Mfg. Co.**, 56 John, N. Y.  
**Mason Regulator Co.**, Boston, Mass.  
**Reading Fdry. Co.**, Reading, Pa.  
**Wood, R. D. & Co.**, Philadelphia, Pa.  
**Varnish**  
**Standard Varnish Works**, 29 Broadway, N. Y.  
**Vegetable Slicers**  
**Streeter, N. R. & Co.**, Rochester, N. Y.  
**Ventilating Fans**  
**American Blower Co.**, Detroit, Mich.  
**Bayley, Wm. & Sons Co.**, Milwaukee, Wis.  
**Boston Flower Co.**, Hyde Park, Mass.  
**Buffalo Forge Co.**, Buffalo, N. Y.  
**Exeter Machine Wks.**, Boston, Mass.  
**Perkins, B. F. & Son**, Holyoke, Mass.  
**Ventilating System**  
**Ormsby, C. A.**, Melrose, Mass.  
**Ventilator Appliances**  
**Howard & Morse**, 43 Fulton St., N. Y.  
**Ventilators**  
**Drouge & Co.**, Bridgeport, Conn.  
**Merchant & Co., Inc.**, Philadelphia, Pa.  
**Ventilator Openers**  
**Ormsby, E. A.**, Melrose, Mass.  
**Vises**  
**Athol Machine Co.**, Athol, Mass.  
**Bighall & Keeler Mfg. Co.**, Edwardsville, Ill.  
**Hollan Mfg. Co.**, Erie, Pa.  
**Howard Iron Works**, Buffalo, N. Y.  
**Lewis Tool Co.**, 44 Barclay St., N. Y.  
**Clark, Chas. Co.**, Meriden, Conn.  
**Prentiss Vise Co.**, 44 Barclay, N. Y.  
**Utica Drop Forge & Tool Co.**, Utica, N. Y.  
**Wagon Jacks**  
**Corvett Mfg. Co.**, West Troy, N. Y.  
**Corvett's Saddlery Works**, Farmer, N. Y.  
**Lane Bros. Co.**, Poughkeepsie, N. Y.  
**Washers**  
**Hal's, Sam'l Sons**, 229 West 10th St., N. Y.  
**Haskell, Wm. H. Mfg. Co.**, Pawtucket, R. I.  
**Nut & Washer Mfg. Co.**, Milwaukee, Wis.  
**Wilson & Smith**, Worcester, Mass.  
**Washers, Lead**  
**Milton Mfg. Co.**, Milton, Pa.  
**Washing Machines**  
**Brammer, H. F. Mfg. Co.**, Davenport, Ia.  
**Clark, Quilen & Morse**, Peoria, Ill.  
**Richmond Cedar Works**, Richmond, Va.  
**Wayne, Anthony Mfg. Co.**, Ft. Wayne, Ind.  
**Watchman's Clocks**  
**Nanz, C. & Co.**, 127 Duane St., N. Y.  
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**Kennedy Valve Mfg. Co.**, 73 John St., N. Y.  
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**Stanley Works**, New Britain, Conn.  
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**Wire**  
**Dillon-Griswold Wire Co.**, Sterling, Ill.  
**Grand Crossing Tack Co.**, Grand Crossing, Ill.  
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**National Wire Co.**, New Haven, Ct.  
**New Haven Wire Mfg. Co.**, New Haven, Conn.  
**Prentiss, Geo. W. & Co.**, Holyoke, Mass.  
**Reading Screw Co.**, Norristown, Pa.  
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**Stewart Wire Co.**, Easton, Pa.  
**Townsend, C. G. & E. F.**, New Brighton, Trenton Iron Co., Trenton, N. J.  
**Warner Bros. & Co.**, Bridgeport, Conn.  
**Wolf, R. H. & Co., Ltd.**, 118th St. and Harlem River, N. Y.  
**Wright & Colton Wire Cloth Co.**, Worcester, Mass.  
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**Bridgeport Chain Co.**, Bridgeport, Ct.  
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**Oneida Community, Ltd.**, Niagara Falls, N. Y.

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**Clinton Wire Cloth Co.**, Clinton, Mass.  
**Derby, Edward & Sons**, Philadelphia.  
**Ester Wire Works Co.**, 65 Fulton St., New York.  
**Gilbert & Bennett Mfg. Co.**, 43 Cliff St., New York.  
**Howard & Morse**, 43 Fulton St., N. Y.  
**Hungerford, U. T.**, Brass & Copper Co., 121 Worth St., New York.  
**Ludlow Saylor Wire Co.**, St. Louis, Mo.  
**Michigan Wire Cloth Co.**, Detroit, Mich.  
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**Scheeler's Sons**, Buffalo, N. Y.  
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**Wickwire Bros.**, Cortland, N. Y.  
**Wright & Colton Wire Cloth Co.**, Worcester, Mass.  
**Wire Cutters**  
**Chandler & Farquhar**, Boston, Mass.  
**King, J. M. & Co.**, Watertown, N. Y.  
**Utica Drop Forge & Tool Co.**, Utica, N. Y.  
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**McFarland, Wm.**, Trenton, N. J.  
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**Morgan Construction Co.**, Worcester.  
**Mossberg & Granville Mfg. Co.**, Providence, R. I.  
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**Turner, Vaughn & Taylor Co.**, Cuyahoga Falls, O.  
**Wire Mats**  
**Hartman Mfg. Co.**, 309 Broadway, N. Y.  
**Wire Nails**  
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**Dillon-Griswold Wire Co.**, Sterling, Ill.  
**Grand Crossing Tack Co.**, Grand Crossing, Ill.  
**National Wire Co.**, New Haven, Ct.  
**Townsend, C. C. & E. F.**, New Brighton.  
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**National Machinery Co.**, Tiffin, Ohio.  
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**Turner, Vaughn & Taylor Co.**, Cuyahoga Falls, O.  
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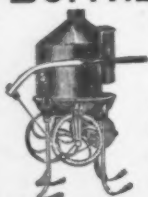
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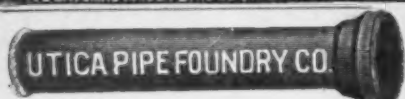
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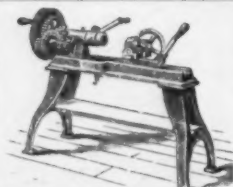
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